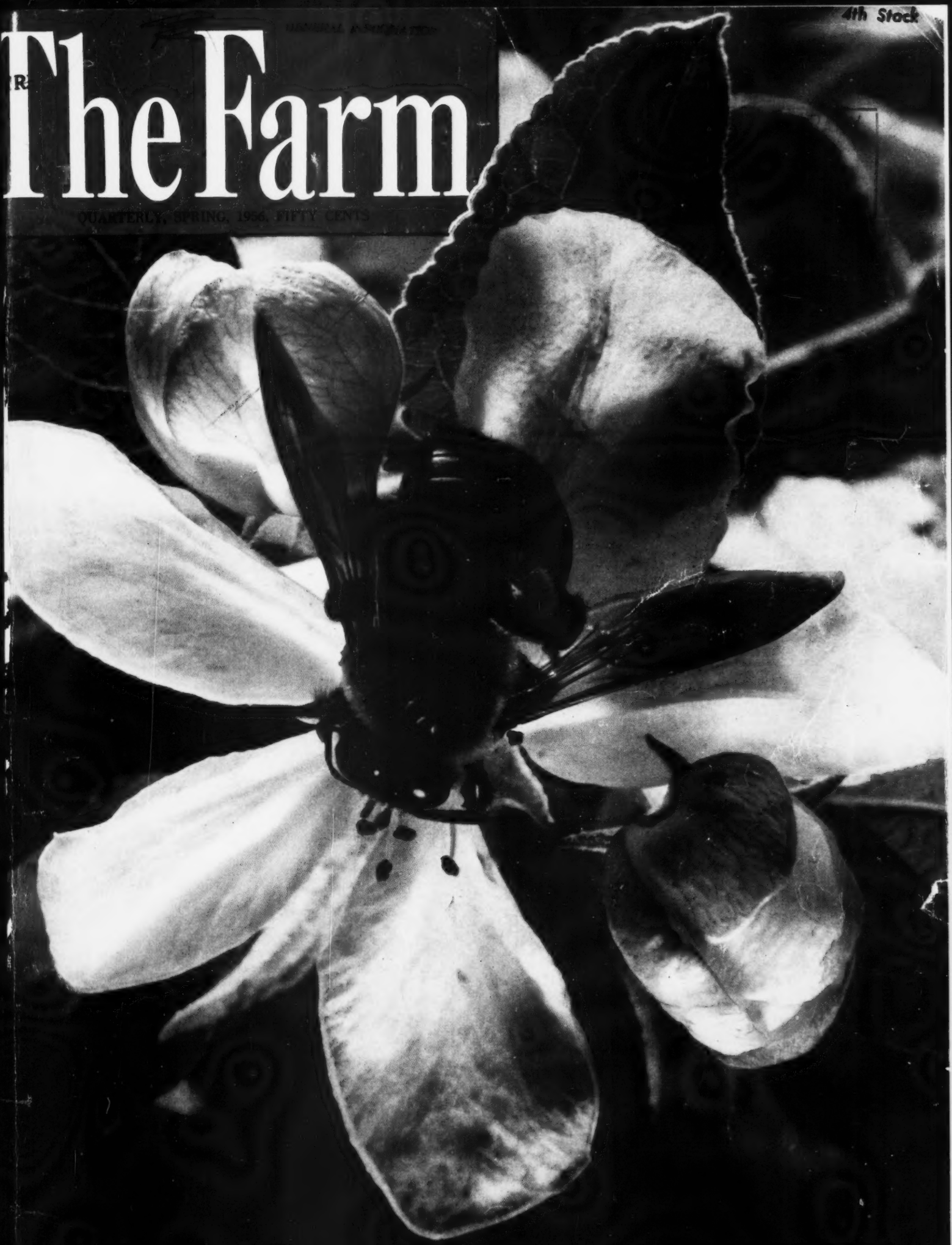
4th Stock

The Farm

QUARTERLY, SPRING, 1956. FIFTY CENTS



10th Anniversary Issue 1946-1956

Straight-lug Wedge-*in* action walks away with winter's meanest jobs!

Why Super-Sure-Grip does more work, keeps tire costs low —

EXCLUSIVE, RULER-STRAIGHT LUGS, coming closer together at shoulders (A) take a "wedge-in" bite that *firms* loose soil—gives "the greatest pull on earth!"

O-P-E-N C-E-N-T-E-R helps *ruler-straight* lugs bite deeper, pull better!

LONG, EVEN WEAR—*ruler-straight* lugs work evenly against soil, roll smoothly on road—and so wear slowly and evenly!

RE-LUGGING SAVINGS — vastly stronger body keeps Super-Sure-Grip *fit* to re-lug or retread—and *re-use.*

Goodyear, Farm Tire Dept.,
Akron 16, Ohio

HAULING A CRANKY SPREADER over wind-swept, slippery slopes can make many a tractor tire spin helplessly.

But Super-Sure-Grip *ruler-straight* lugs seem always to find a hold—and Goodyear's exclusive "wedge-in" action makes the most of it!

This proves again that, while Super-Sure-Grip *appearance* may be copied, *only the real thing* can save you so much time, gas and money on every farm job. That's why survey after survey shows —

MORE FARMERS PREFER GOODYEAR TRACTOR TIRES THAN ALL OTHER MAKES *PUT TOGETHER!*

Look for this sign; there's a Goodyear dealer near you.

GOODYEAR

Super-Sure-Grip Tractor Tires

Super-Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

G-1

It's usable horsepower that counts!

Many passenger car type truck engines have to rev up to high speeds to pull their loads. They strain at the job—cost big money in wear and repair. INTERNATIONAL all-truck engines turn at relatively low rpm—deliver high usable horsepower at normal road speeds, for peak performance, long life, BIG money savings.

International Trucks give you power without strain at safe, economical rpm to save you the BIG money!

Rated horsepower figures don't tell the whole story of truck performance!

Wise truck buyers want to know *more* than rated horsepower. They want to know what actual *usable* horsepower they are going to get to pull capacity loads at normal, legal speeds—without undue engine strain.

Usable horsepower—that's the point to keep in mind when buying trucks.

INTERNATIONAL Truck engines deliver high usable horsepower at economical, wear-reducing speeds. Because they are built for use in *trucks*, with no compromise with passenger car design.

You get the usable power you need, plus longest truck life, every driver comfort and convenience. See your INTERNATIONAL Truck Dealer or Branch for trucks *right* for your farm job—all-truck built to save you the BIG money.

In the world's most complete truck line, there are trucks for every farm job. Pickups. Stakes. Platforms. Combination grain and stock rack models. Every other truck type, including light-duty S-120(4x4) four-wheel-drive (above) that will go anywhere on your farm or on the highway, gives you auxiliary power for a host of jobs.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

All-Truck Built to save you the BIG money!

Motor Trucks • Crawler Tractors • Industrial Power
McCormick® Farm Equipment and Farmall® Tractors

Your veterinarian...

a specialist in Health Engineering

There is plenty at stake these days in owning and managing livestock. Keeping your animals producing at a profit means, first, keeping them healthy. It also means having a friend as near as your telephone to diagnose—to prescribe—to *prevent as well as treat disease.*

To many, this man is fondly known as "Our Vet." To others who employ him for periodic consultation, he is a specialist in Health Engineering, an adviser in a profitable livestock enterprise. His trained eye can detect symptoms of disease while still in the early, controllable stages. He knows the most effective ways to prevent the spread of infection, to save a valuable animal.

Your part in making Health Engineering profitable

It will pay you to help him in every way you can. One of the most beneficial is to keep accurate health and breeding records for every animal in your herd. This will save precious diagnosis time—help make treatment more effective.

As an expert in Health Engineering, your veterinarian brings to your animals all the latest discoveries of veterinary science—knowledge which can save you many times over the cost of his professional services. Many of the new drugs, for example, are almost miraculous in their effect when administered by a man skilled in their use.

Many of these drugs bear the name E. R. SQUIBB & SONS. It is your assurance of pharmaceuticals thoroughly tested...of proved purity and potency. Nearly 100 years of experience as a manufacturer of precision drugs are behind the Squibb name...a name in which you can unhesitatingly place your trust.

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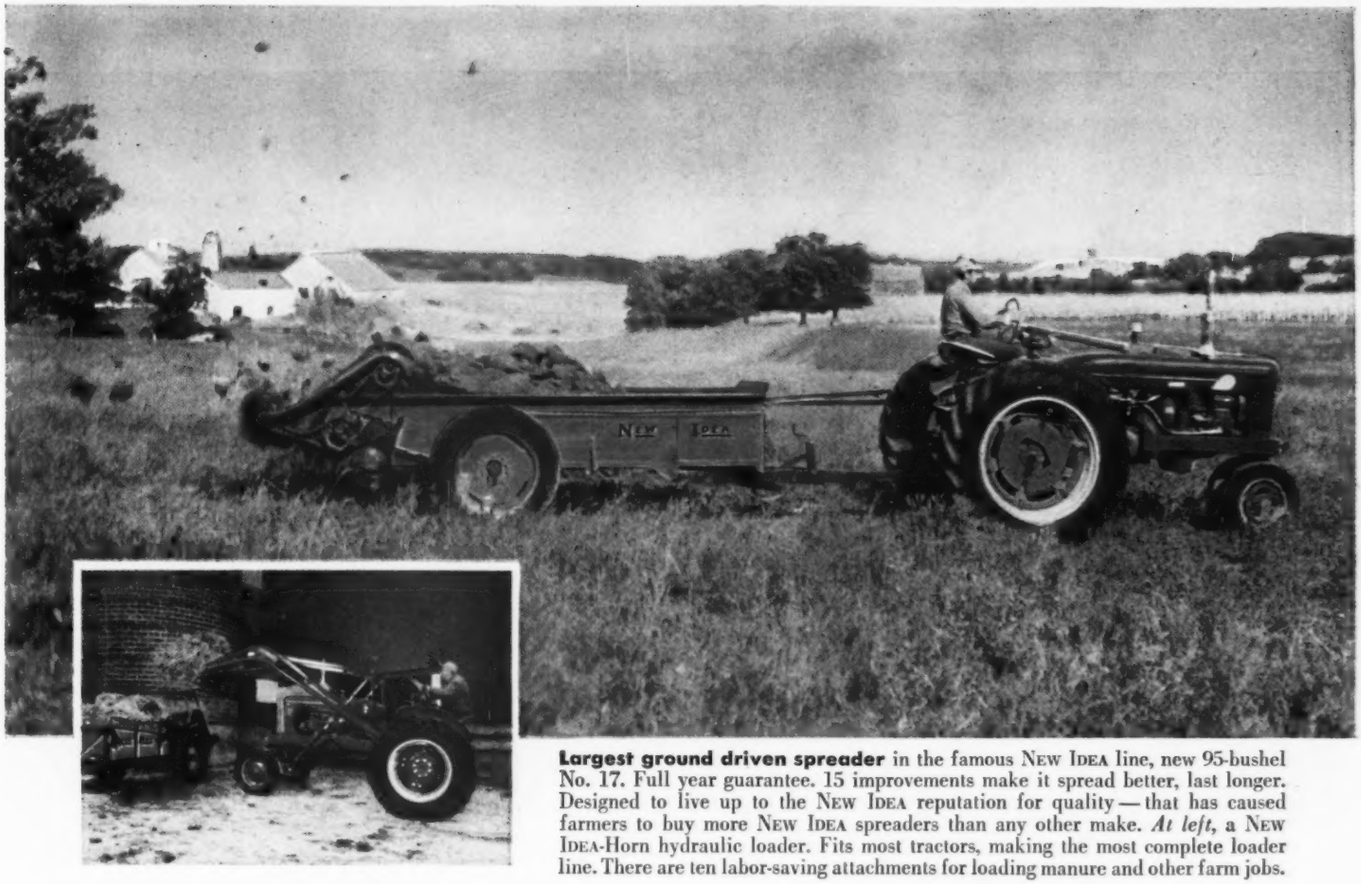
SQUIBB—A NAME YOU CAN TRUST

Farm Quarterly, Vol. Eleven, No. One. Editorial, Circulation and Executive Offices, 22 East 12th Street, Cincinnati, Ohio. Published quarterly by F. & W. Publishing Corp. Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Add $1.00 per year extra for rates outside the United States and Canada. Entered as second-class matter at the Post Office, Cincinnati, Ohio, under the Act of March 3, 1879. (Title Reg. U.S. Pat. Off.)



Largest ground driven spreader in the famous NEW IDEA line, new 95-bushel No. 17. Full year guarantee. 15 improvements make it spread better, last longer. Designed to live up to the NEW IDEA reputation for quality — that has caused farmers to buy more NEW IDEA spreaders than any other make. *At left,* a NEW IDEA-Horn hydraulic loader. Fits most tractors, making the most complete loader line. There are ten labor-saving attachments for loading manure and other farm jobs.

The spreaders that do the job best

Three new fertilizer spreaders with guaranteed accuracy. New 10-foot NEW IDEA spreader No. 101, and 8 and 12-foot models. Available with new front-mounted grass seeding attachment with 60% increased capacity. Also three 5-foot models. New spreaders have greater strength, longer life.

See the new PTO giant of the New Idea spreaders. No. 19, with 125-bushel capacity, full year guarantee. New clutch makes possible disengaging distributor and cylinders independently of conveyor for easy clean-out. New triple-staggered U-teeth in upper cylinder make this giant for work do finest shredding. Plus many new features to provide tremendous strength and long life needed for the big jobs. Write for FREE booklet on manure handling. *Best idea yet . . . get a New Idea.*

NEW IDEA Farm Equipment Co., Division AVCO Distributing Corporation, Department 1756, Coldwater, Ohio

Every 10 Minutes!

on the average — day and night,
24 hours a day, 365 days a year

$5 Surge Milker Unit DOWN

...and up to 24 months to pay!

You can buy any kind of Surge Cow-Milking Equipment on *EASY TERMS*... a low down payment and up to 24 months to pay the balance. That covers Pipelines, Parlor Stalls... everything. You can afford to own a Surge!

Every ten minutes, a shining, bright new Surge Milker goes into somebody's barn somewhere.

We are sure that is because so many well-experienced Surge users have told their neighbors that Genuine Surge TUG & PULL delivers exceptionally good, safe and fast cow milking.

They have told them that Organized Surge Service makes the Surge keep right on being a good cow milker.

If you should decide that a Surge Milker would save you some work and some time and be better for your cows, just remember that you can buy one of these bright new Surge Units for FIVE DOLLARS DOWN and up to 24 months to pay the balance.

Right is reserved to withdraw this proposition at any time.

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Take the miracle demonstration drive . . .
most unusual trial offer in tractor history

FREE! Schedule an on-the-farm demonstration now. Call your Massey-Harris dealer today. For your promptness he has a special get-acquainted gift for you.

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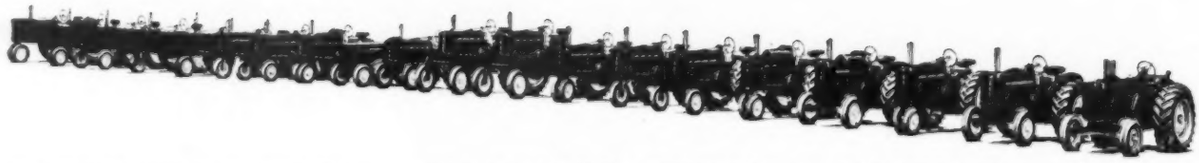
Why Wait for *Tomorrow's Promise?*

ADVANCED *Power Steering is Yours TODAY*

in a Great Fleet of JOHN DEERE TRACTORS



IT'S the Success Story of the Tractor Industry!

Nearly two years ago, John Deere introduced Factory-Engineered Power Steering on row-crop tractors. **No other single tractor feature has ever received such widespread and enthusiastic acceptance.**

Just as the self-starter ended the drudgery of cranking by hand so has John Deere Power Steering taken the muscle work out of tractor driving—brought new freedom to farmers everywhere and made it easy for the wife, son, daughter, or an elderly member of the family to operate the tractor with perfect confidence.

Today, there are thousands upon thousands of John Deere Power Steering Tractors at work on farms the country over—more by far than those of all other makes combined.

And today, the new John Deere Tractors offer you **Advanced** Power Steering—steering that is even smoother in its operation . . . even more quickly responsive to your command.

Advanced Power Steering is the ultimate in steering ease—a 'way-ahead John Deere feature that will make your farming much more enjoyable for years to come, and bring you more for your tractor at trade-in time. See your John Deere dealer soon and arrange to try **Advanced** Power Steering on the John Deere Model "50," "60," "70," or "80" Tractor of your choice.

JOHN DEERE

JOHN DEERE QUALITY FARM EQUIPMENT

MOLINE, ILLINOIS

You Put a New Twist in Your Work —

WHEN YOU USE PROTO PROFESSIONAL-QUALITY ADJUSTABLE & PIPE WRENCHES

You can do your work better, faster and with less effort when you buy adjustable and pipe wrenches with these great features:

PROTO ADJUSTABLE WRENCHES are streamlined, with thin, extra strong jaws for narrow spaces, yet deep enough to fully seat both hex and square nuts. Sturdy I-beam handles give you great strength with less weight.

And PROTO PIPE WRENCHES have jaws forged from alloy steel, with deep, sharp teeth to give you a better "bite".

See your dealer for the complete line of PROTO adjustable and normal or heavy-duty pipe wrenches. Send 10¢ for catalog of entire line to

PLOMB TOOL COMPANY
2266H Santa Fe Ave., Los Angeles 54, Calif.

Adjustable and heavy-duty pipe wrench.

Eastern Factory, Jamestown, N.Y. • Canadian Factory, London, Ont.

The Farm QUARTERLY

Spring, 1956, Volume 11, No. 1

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THE FARM QUARTERLY
22 East Twelfth Street, Cincinnati 10, Ohio

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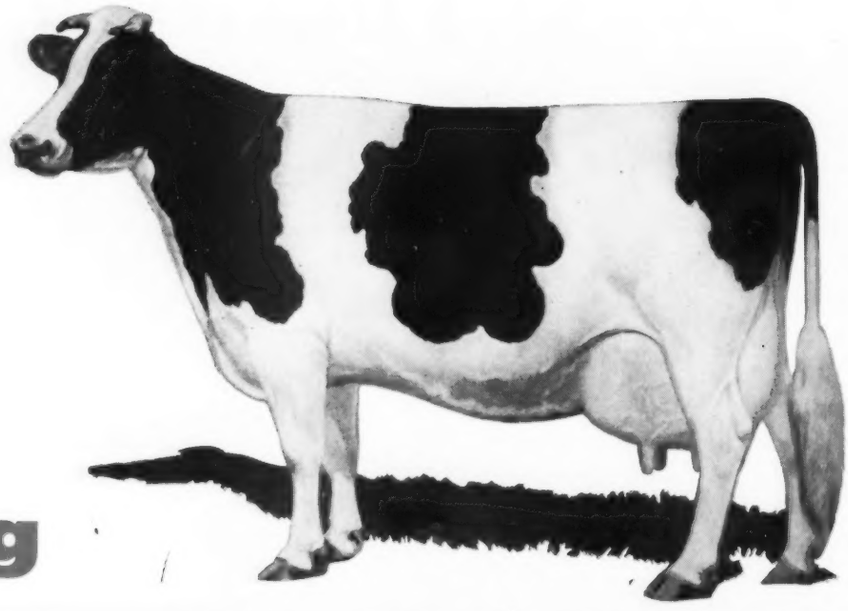
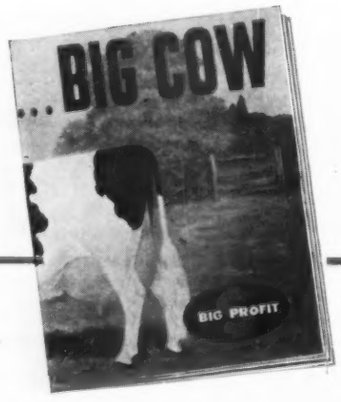


Big REGISTERED HOLSTEINS

fit the farm...
...fit the market

"Big Cow . . . Big Profit"

is the title of a beautifully-illustrated new booklet . . . a guidebook that can open a new future for you with REGISTERED HOLSTEINS. Send for your copy today. Include ten cents to cover handling costs.



Dairy farming, 1956 style, is big business . . . a business in which cash costs have more than tripled in the past generation.

Big investments and big operating costs demand big cows . . . big forage consumers . . . big producers . . . big money-makers . . . big REGISTERED HOLSTEINS.

REGISTERED HOLSTEINS fit the farm. Big and rugged, they hold practically all milk and butterfat production records and they do it at maximum efficiency. Big production per cow is the key to bigger profits per acre . . . per man hour . . . per dollar invested.

REGISTERED HOLSTEINS fit the market. The big demand today is for moderate fat milk produced so efficiently by REGISTERED HOLSTEINS. It far outsells all others in free-choice markets.

Think "big" when planning for 1956 . . . join the big swing to REGISTERED HOLSTEINS . . . the breed that returns bigger dividends.

The Holstein-Friesian Association of America, Brattleboro, Vermont

REGISTERED HOLSTEINS
Breed of the times

New 5-Step Program Helps You

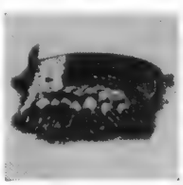
Cut Your Feed Costs!

46 gilts and 26 sows farrowed 792 live pigs last May under practical farm conditions at the Wayne Research Farm. That's an average of 11 pigs per litter. Average weight per pig—3.03 pounds.*

**(national average—6.9 pigs per litter).*

New Wayne Hog Feeding Program Gives Low-Cost, High-Speed Gains

There are five definite stages in the growth of pigs and getting them to market. Supplying the exact nutritional needs in each stage gives faster gains . . . cuts total feed costs. Feeding studies on more than 4,000 pigs at the Wayne Research Farm helped Wayne to develop a completely new 5-step low-cost, high-speed hog feeding program—built to give you these benefits . . .

1. 

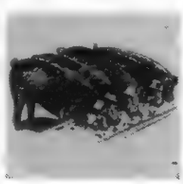
for **Bigger, Stronger Litters . . .** feed **Wayne Brood Sow Supplement.** Proved to be a real pig-maker at the Wayne Research Farm. Supplies the vitamins, minerals, and proteins lacking in farm grains but needed by sows during gestation and nursing.

2.

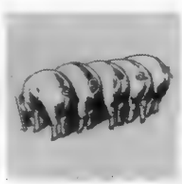
for **Pre-Starting Baby Pigs . . .** feed **Wayne Tail Curler Rockets.** Powerful, sugar-sweet pellets start baby pigs *fast as a rocket.* In feeding tests, Rocket fed pigs were over 10% heavier at weaning time than pigs that did not get Rockets.

3.

for **Heavier Pigs at Weaning . . .** feed **Wayne Tail Curler**—an improved, *more* palatable Tail Curler that speeds pigs on to heavier weaning weights even faster than ever before. Highly fortified. Contains amazing growth stimulating powers.

4. 

for **Growing Shoats** at Lower Cost ...feed **Wayne Pig Balancer.** A new specially fortified supplement for 50 to 100 lb. pigs. Grows pigs and shoats rapidly and economically. Properly balances farm grains to produce *fast, low-cost* gains.

5. 

for **Earlier Marketing . . .** feed **Wayne Hog Balancer**—a powerful supplement specially blended for hogs over 100 lbs. Supplies nutrients lacking in farm grains at low-cost. Promotes faster gains—earlier marketing.

Special Feeds for Special Needs

Wayne Hog Worming Mixture: Over 95% effective for removing large roundworms in Wayne tests. Easy to feed. Gives pigs an extra nutritional boost—helps keep them gaining and on-feed without set-back.

Wayne H-A-D Krums: When enteritis or scours indicate the need for a High-Antibiotic Diet, feed WAYNE H-A-D Krums for 3 to 5 days.

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FREE Firestone TRACTOR TIRE AIR MEASURE GAUGE

CUTS YOUR FARM TIRE COSTS

You can cut your farm tire costs by using the Free Firestone Air Measure Gauge. It will eliminate 70% of premature tractor tire failures that are known to result from overinflation and underinflation of rear tractor tires.

The new Firestone Air Measure Gauge is so simple that even a child can use it correctly. It will always indicate correct tractor tire inflation to provide maximum traction, regardless of the metal or fluid weights applied to tractor wheels or the varying loads placed upon tires when different implements are used.

Firestone Air Measure Gauges are available free of charge at Firestone Dealers and Stores. Tell your Firestone Dealer or Store Manager the size of the tires on your tractor and you will be given a gauge for that specific size.

Get yours FREE at your nearby Firestone Dealer or Store

Tractor tire tread depth (above) is instantly and accurately measured by inserting the handle end of the new Firestone tractor tire Air Measure Gauge between the tread traction bars. If tread depth "A" is indicated (as shown here) the rim of a properly inflated rear tractor tire will fit snugly into the notch on the arm of the gauge marked "A" (right) when the handle arm of the gauge is placed on the ground and turned toward the tire rim. If the rim is above the notch, an overinflated condition exists. If the rim rests below the "A," the tire is underinflated.

MAKE FIRESTONE YOUR HEADQUARTERS FOR ALL YOUR TIRE AND SERVICE NEEDS

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FIRST BY FERGUSON

4-Way Work Control on the

FERGUSON 35

How Ferguson Variable-Drive PTO Provides Both Ground Speed and Engine Speed Drive

At last! *One* tractor that lets you operate PTO-driven implements at either *ground speed* or *engine speed*, depending upon the need.

Simply move the lever to "Ground" PTO and you're ready to do a perfect raking job... distribute seed or fertilizer evenly in direct ratio to ground covered—because the PTO shaft will always revolve the same number of times per foot of forward travel, regardless of tractor speed.

Or you can select "Engine" PTO and the shaft rotates in ratio to *engine* speed for such jobs as harvesting, mowing, belt work. It's that simple. *It's that convenient!*

And, in addition, you get those other 4-Way Work Control features that have come to mean so much to Ferguson owners: Quadramatic Control, Dual-Range Transmission and "2-Stage" Clutching—all designed to help you farm more, work less.

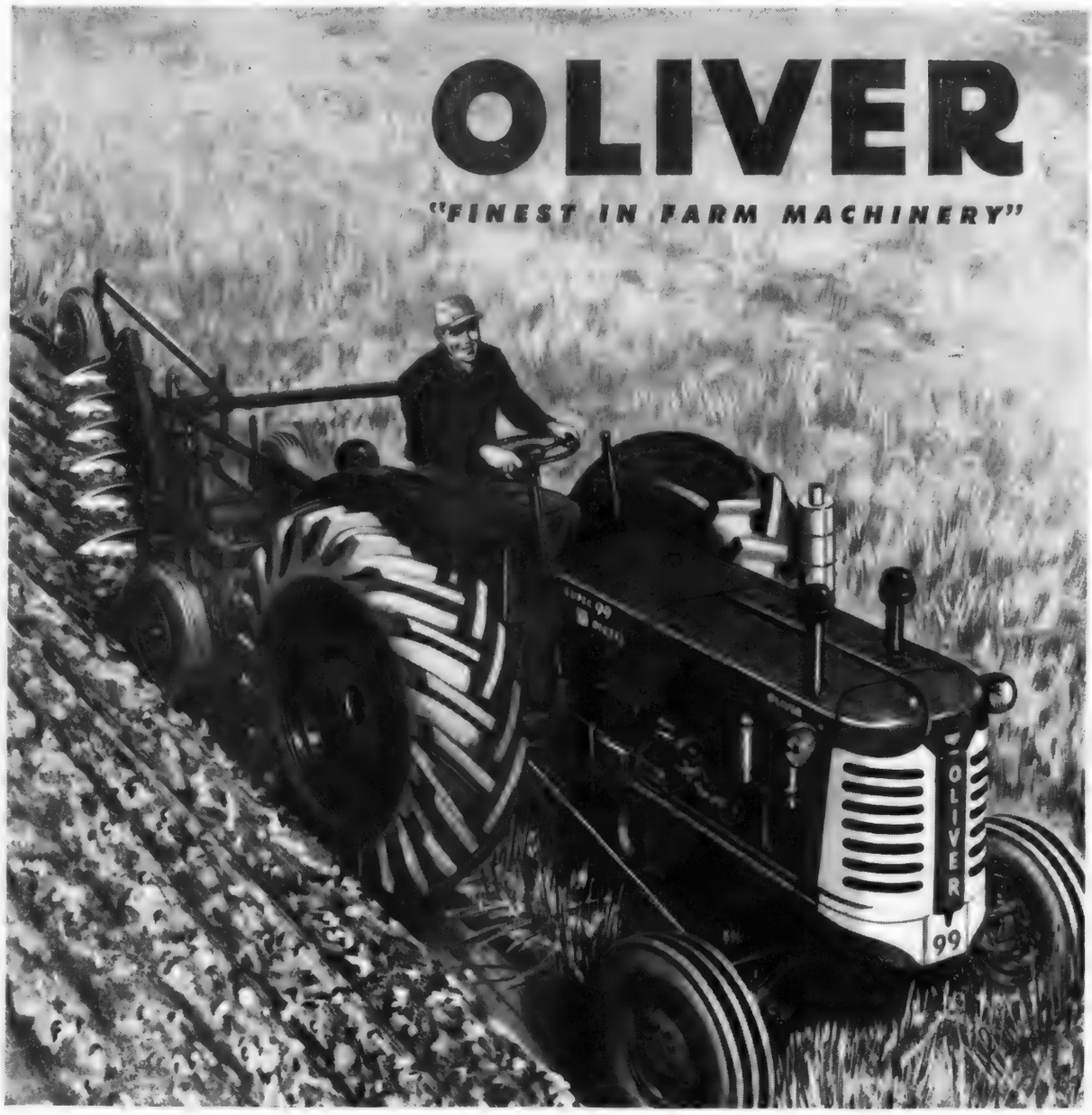
Ferguson Dealers have had *years* of experience in sales and service of the *original* Ferguson System. Call your local Dealer today for a demonstration of the Ferguson "35" . . . and *feel the difference* on your day-to-day jobs. *Ferguson*, Racine, Wisconsin.

Ferguson

FOR HARVESTING you'll use the power take-off that's driven directly from the engine.

SEEDING-FERTILIZING utilizes "ground" drive for even distribution at uniform rate.

FOR RAKING put the PTO shift in "ground" position for rake action in ratio to forward travel.



The Super 99 GM Diesel, most powerful farm tractor on wheels.

Saving a big 2/3

When you operate the most powerful farm tractor on wheels, the Oliver Super 99 GM Diesel, the two-thirds fuel saving becomes a bigger saving.

Oliver diesel tractors, made in six sizes, normally require only six gallons of diesel fuel to do the work of ten gallons of gasoline. And diesel fuel costs less per gallon. It adds up to around a two-thirds cut in fuel costs dependent on local prices.

When you are doing a lot of work faster, such as pulling six bottoms with this big tractor, you are saving big money. With Oliver diesels, the more power you use, the more you save.

Oliver leads in diesel tractors. Only Oliver can furnish a diesel powered tractor in all six of its wheel tractor sizes.

These are real diesels with no special starting devices and no different starting fuel. Press the starter button and you are ready for work.

Before you buy any tractor, may we suggest you see your Oliver Dealer and investigate Oliver diesel savings and the many exclusive features of Oliver tractors.

The Oliver Corporation
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Chicago 6, Illinois

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Get up to 200 Bu. Corn per acre • 100 Bu. Wheat
30 Tons Tomatoes • 750 Bu. Potatoes
5 Tons Hay • Up to 300% Increase in Milk

Make More Money in Spite of Lower Prices!

Fields full of healthy, vigorous crops are a beautiful, satisfying sight to any farmer. They are proof of a job well done! Whether you farm 10 acres or 1,000, Soil Tests will make every acre a record breaker. You'll have yields of better quality, at lower cost. Every field you test can bring you as much as $500 or more in extra profit — at the same time you're building up your land instead of wearing it out.

Save Up to $15 an Acre on Fertilizer

Besides getting bigger yields you'll save money on fertilizer — use only what your soil needs. Guessing costs plenty — wastes both time and money. A Pennsylvania farmer was going to spend $700 for lime but not a single field needed any; some already had too much. He not only saved $700, he got better crops without it.

You can't afford to buy fertilizer and not know it's what your soil needs. Soil testing makes it a sure investment. You'll get back up to $10 or more in extra yield for every dollar's worth of fertilizer, like the Ohio farmer who boosted corn yields 300%, oats 500%, wheat 100%, hay 300%, with his Sudbury Soil Test Kit.

Farmers deLuxe Soil Test Kit

So simple anyone can use it! So reliable that county agents, ag. colleges, extension workers and progressive farmers everywhere depend on it. Complete with everything for hundreds of tests. More valuable than all your stock and tools! Shows right amounts of nitrogen, phosphate and potash for each field. Also whether lime is needed (pH) and how much. Lifetime welded steel chest with carrying handle. Easy instructions show needs of 225 different crops. Ready to use anywhere, anytime, even out in the field. No delays waiting for reports — the answer is printed right on the chart. Stop guessing — order today. **Big Value, only $29.95.**

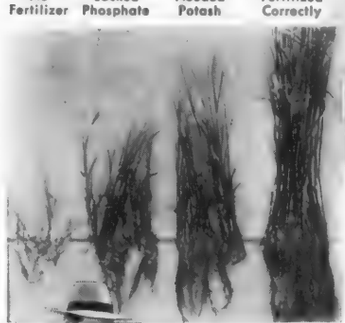
No Knowledge of Chemistry Needed

Easy as Reading a Thermometer

Even your first tests will be accurate and reliable. Takes only 10 minutes, costs less than 10c a test! The Dept. of Agriculture approves of Soil Test Kits for farmers.

You Can Be Wrong — Soil Tests Never Are!

No Fertilizer | Lacked Phosphate | Needed Potash | Fertilized Correctly



The right fertilizer, guided by soil tests produced the bumper corn yield in the bin at right, above.

These wheat tests by a leading ag. college show yield increased ten-fold with proper fertilizer. See the vigorous root system as well as heavy top growth of plant at right. Even when only phosphate or potash was lacking, yield dropped as much as 40%.

Better Crops Guarantee

You take no risk—even next fall if you didn't have bigger, better crops after using your Soil Test Kit this spring and summer, send it back and we'll return your money — our Daring Guarantee!

SEND NO MONEY —We'll mail C.O.D. plus postage. Or send check and we'll pay postage, saving you from $1.91 to $3.55 in postal charges.

FREE BOOK —If you send check, we'll also include a valuable book on farm management, "Our Land and Its Care." If not delighted with your Soil Test Kit, return it in 10 days for full refund.

Money-Back Guarantee

FREE TRIAL

425,000 Users Can't Be Wrong!

S.H. of Michigan "guessed" his potato field had enough potash but needed nitrogen. Tests showed he was wrong. He used potash and doubled his yield!

R.S.G. of Indiana tested his soil and has reduced fertilizer costs by using only what his Sudbury Soil Test Kit showed was needed.

A.D. of Indiana nearly doubled his corn yield after testing his soil.

A.F.B. of Iowa increased his bean yield 50% by correcting phosphate and potash deficiencies his Sudbury Soil Test Kit revealed.

W.L.D. of Pennsylvania saved $400 on fertilizer. "The Kit has paid for itself over and over again."

G.H., Ohio "Have made many tests; like its simplicity and accuracy. Worth 1000 times its cost on my 320 acres."

SUDBURY LABORATORY, Box 263, South Sudbury, Mass.

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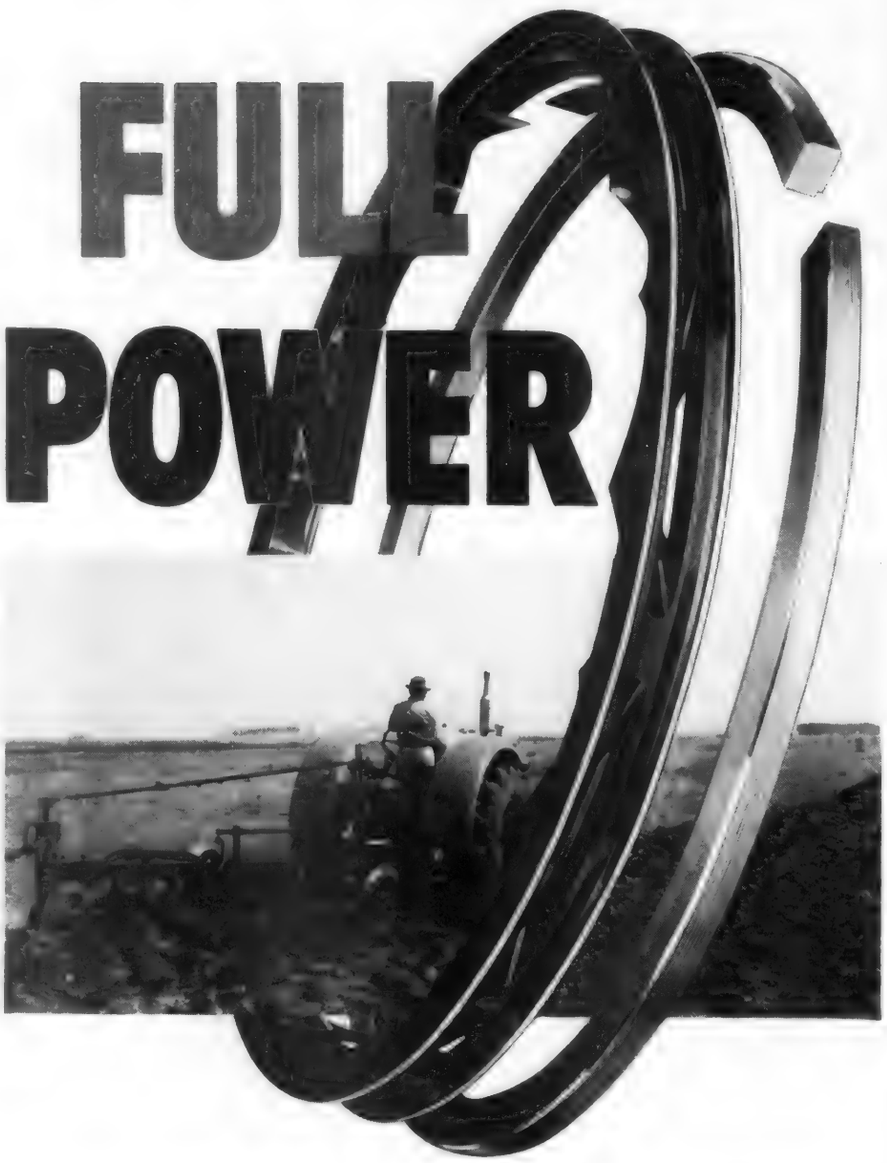

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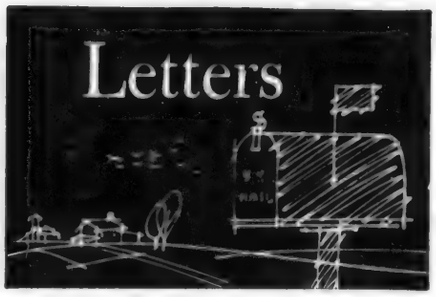

According to the Bible

Sirs:

Your article entitled "Subsoiling" has brought to a focus the findings of one who is thoroughly converted to the advantages that deep tillage brings. To any man who feels that surface soil is a layer of inert matter covering the earth that should return maximum results with minimum effort I have no word of encouragement. However, to the man who believes that surface soil with its accompanying subsoil is a living soil laboratory in which mechanical, chemical and bacteriological forces are at work to balance the investment of his labor, I feel that that man is aiming at an attainable goal.

In the Parable of the Soils—Matt. 13:8—the Master speaks of the seed which fell on good ground and brought forth fruit, some one hundred fold, some sixty fold, some thirty fold. To my mind, the faithful farmer is striving toward 100 per cent of a normal yield.

Subsoiling is basic to this attainment. It raises the water table in dry soils by capillary attraction and lowers the water table in wet soils by drainage, thus equalizing the soil water to the root hairs of the growing plant. Plant life can take its food only in liquid form. There is no other medium through which it can gain its sustenance.

Elisha in I Kings 19:19, followed subsoiling as a farm practice in Palestine. With 24 head of oxen on a tandem hitch, he could have been able to penetrate his ground to a depth equivalent to our 25 or 30 h.p. track type tractors today. Following this practice in the dry season, the channels broken by the tillage implement he used could hold the rainfall of the wet season as a reservoir for the root system of the crop that he was planning to sow. The modern equipment used in Palestine today by the Jewish farmers verifies this practice.

Wilbur F. Nash, Jr.

Derwood, Maryland

More Subsoiling

Sirs:

May I compliment you on the fine article on Subsoiling which appeared in the Winter Issue. As I have been and still am a student on soils, I appreciated the thought put into that splendid article and enjoyed reading same immensely.

Was glad to note the reference to soils and subsoiling in New York State and that conditions might be different elsewhere. In this connection I would like to quote a paragraph from the Chautauqua County, N. Y., Soil Survey Report on Page 57, issued May 22, 1916, or about 40 years ago, under the heading "Drainage".

"Adequate drainage of the soil and subsoil is the first requisite of good farming. Without reasonable drainage all efforts at good tillage and the use of lime, manure, and fertilizers are of little avail."

The soils in the Counties of Western New York are quite variable to say the least. Others have said that every farm is a law unto itself as far as the soil is concerned, and I know it from much experience.

When one considers that a soil to be productive must contain rock particles, organic matter, air, water and bacteria and knows how plants of various kinds grow, thrive and produce and

Daring New 3-plow tractor . . .

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Get the inside story of the Case "300"—its 12 speeds, Tell-Easy instrument panel, 2-clutch convenience. Mark here or write in margin any tractor or implement that interests you. J. I. Case Co., Dept. D-906, Racine, Wis.

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Ask your neighbors what they think of New Holland balers, twine-tie or wire-tie—family-farm size or this big "Super 77" custom baler. Take a look at them working in fields around you. Then see your New Holland Dealer. He has a complete selection—engine-powered and P.T.O. models—whichever suits you best. One thing's sure, nothing beats the time-saving and convenience of having your *own* New Holland, the baler that keeps going . . . bale after bale, day after day, season after season. You put up better hay, too.

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Start your new baler off with New Holland Twine, certified by U.S. Testing Co. for strength and length. It ties more bales. New Holland Machine Co., subsidiary of Sperry Rand Corp., New Holland, Pa.

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The "Super 77"—the professional's baler—bales up to 12 tons an hour, all day long.

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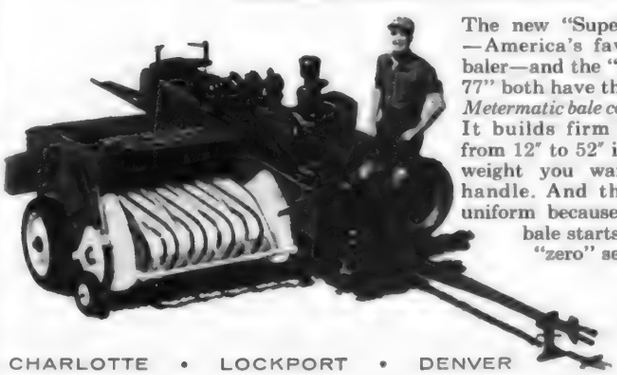

The new "Super 66"—America's favorite baler—and the "Super 77" both have the *new Metermatic bale control.* It builds firm bales from 12″ to 52″ in any weight you want to handle. And they're uniform because each bale starts from "zero" setting.

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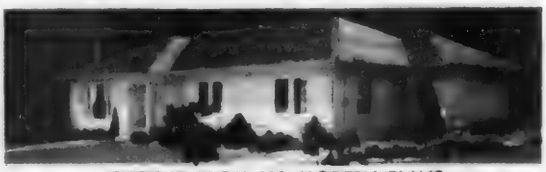

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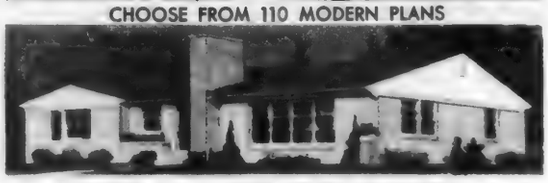

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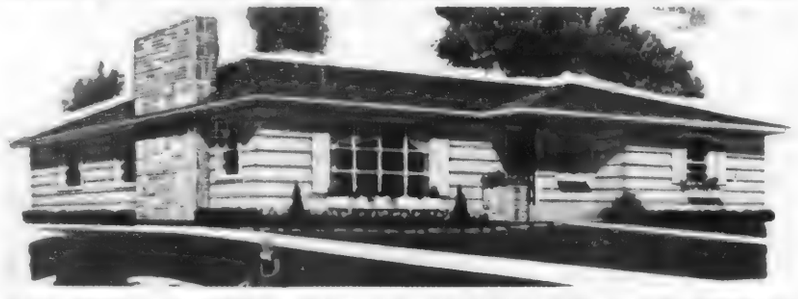

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their requirements or response to certain factors, he can then well realize what effect subsoiling in various types of soil may have and the benefits to be derived from improved moisture and drainage conditions in his particular case.

Subsoiling no doubt, will not show all the benefits the first year or even the second year in some soils, but as subsoil stores up more water each year as well as plant food for dry years, and likewise can carry down water to prevent saturation or flooding of the surface soil in wet years or seasons, there is no question that a better balance will have been established and that such a reservoir will be of benefit to the plants as needed.

Thanks again and more power to you in the future for another good article on the subject.

Wm. J. Schirmann

Buffalo, New York

Farm on the Cover

Sirs:

Your Winter issue had a beautiful picture on the cover. We spent fifteen minutes looking through the magazine trying to find out where it was taken and we finally found a notice in the back, "Cover by Grant Heilman."

We are always interested in where your covers are taken. How about writing them up more? My husband thinks this one was taken in upper New York state. Is he right?

Emily W. Browning

Eppe's Island Farm
Charles City, Virginia

Sorry M'am, your husband is wrong. Grant Heilman tells us the picture was taken on the farm of Ralph Myer, R. 3, Manheim, Pennsylvania. He goes on to say: "There aren't many chances for the Myer youngsters to use the pond these days. Winters here in Lancaster county have been so warm recently that kids hardly know any longer what skating is.

"The Myer farm is a typical Pennsylvania Dutch farm, with massive bank barn and solid farm house built to last for generations of hardworking farmers. Good farming is a long tradition among Ralph's ancestors, as it has been among all of Lancaster county's farmers."

Always Faithful

Sirs:

Last summer when I was traveling in England I noticed a stone statue of a dog in the rather lonely and isolated hills of Derbyshire. I was curious about it and on inquiry I found that it had been erected by shepherds to commemorate the devotion and loyalty of a sheep dog named Tip. In the winter of 1954 Tip's master died in the snow and his dog guarded the body for 15 weeks, until the body was found and buried. The dog was 13 years old and how she kept alive in the cold and snow is a mystery. She died soon after her master's body was found and lies beside him in the village cemetery.

I thought this example of a dog's loyalty very touching and would be of interest to your readers.

Matthew Stoneman

Quigley, Iowa

Cattle sans Oil

Sirs:

I want to congratulate you for your courage in publishing the fine and enlightening article "The Swing of the Pendulum" in the Winter issue. Here in the Southwest, where we don't all have oil wells even though oil men speak for cattlemen here in Texas, we who are still in the cattle business on a money-making basis, with cattle and not oil, learned several years back that no one super-breed of English cattle was the answer. Consequently, a great number of various interesting breeds or cross-breeds have come into being, and, as our San Antonio Livestock Show displays each year in February, a number of these have been quite successful in this great Southwest of submarginal land, where we have lots of heat and very little rain; all of these breeds carry some percentage of Zebu or Brahman blood.

As a result of keeping our San Antonio show open to all breeds of beef cattle it has continued to grow each year, despite the drought and low cattle prices, with greater numbers of exhibits of the different kinds of new cattle that are proving the sensible and practicable route to follow.

Jess McNeel

San Antonio, Texas

(*Continued on page* 94)

Here's excellent news
To chase "old-wall blues". . .
Just see how completely it covers!
It's a paint without smell,
And takes scrubbings well . . . it's
That wonderful paint by Lowe Brothers!

A wonderful way to paint!

Natural color photograph by Wesley Bowman

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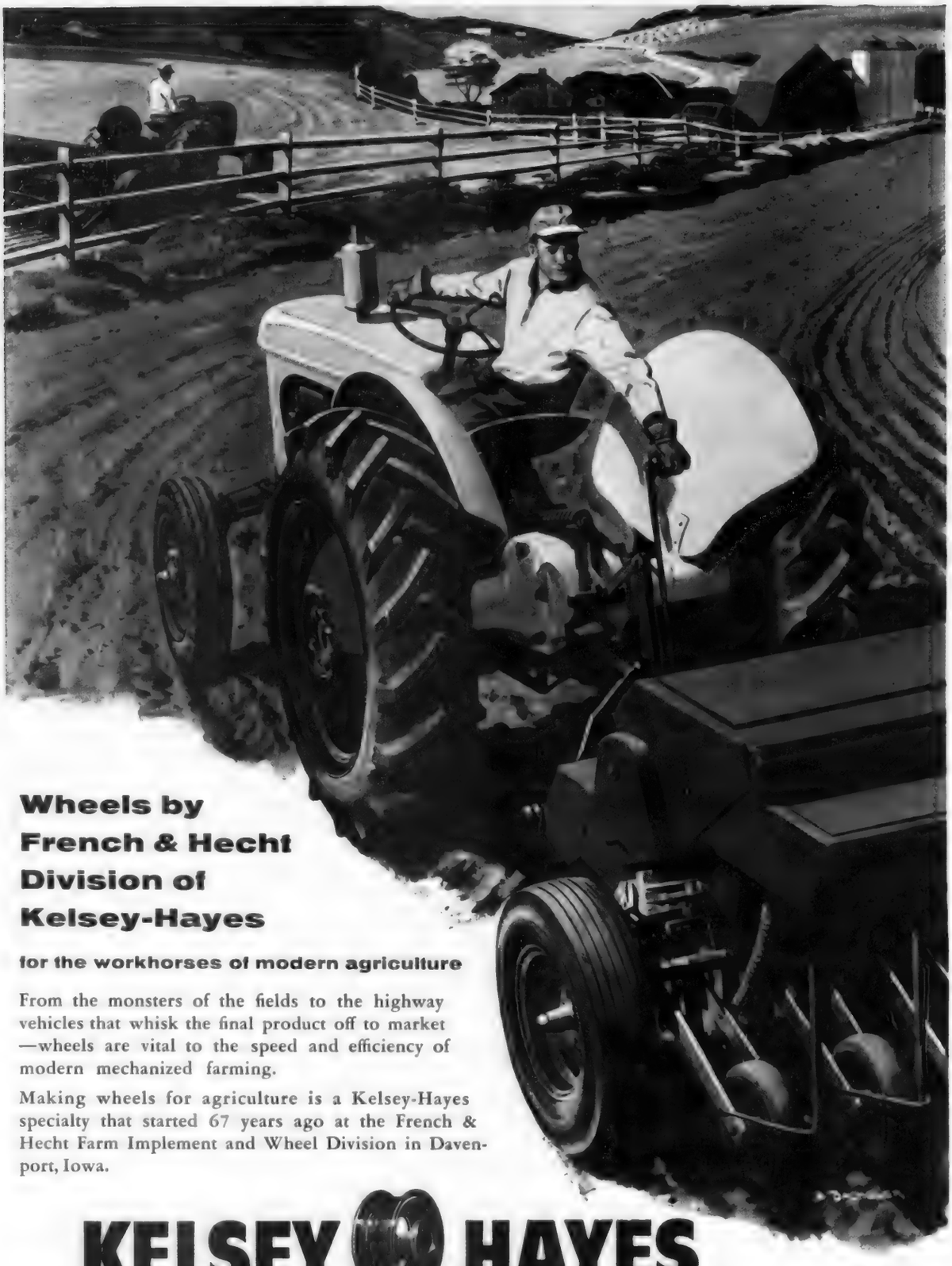

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From the monsters of the fields to the highway vehicles that whisk the final product off to market —wheels are vital to the speed and efficiency of modern mechanized farming.

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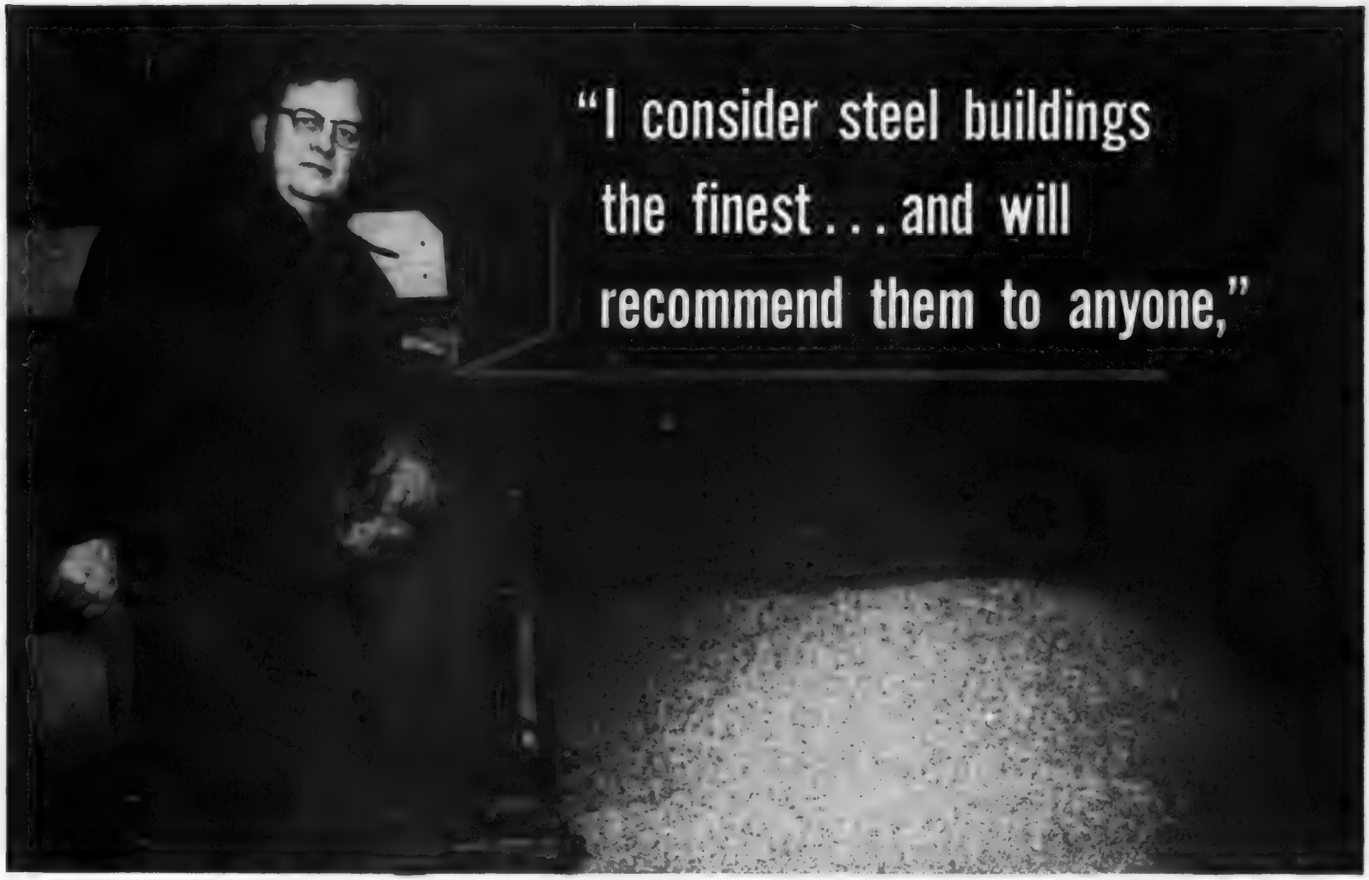


says Howard Henry, Westhope, North Dakota

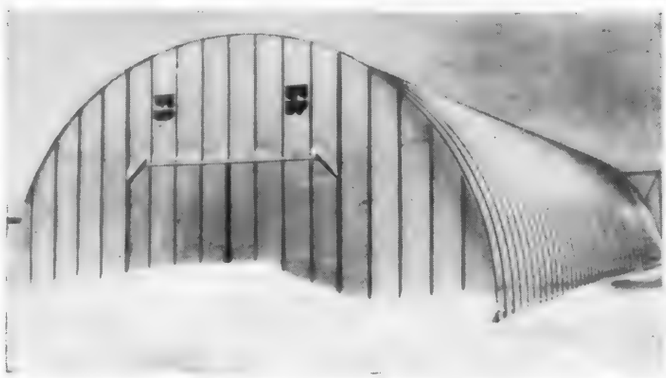
Mr. Henry has a 36′ x 100′ galvanized steel building on his farm, in which he stores 16,000 bushels of wheat and two self-propelled combines. He likes his steel building so well that he plans to erect a 30-foot addition to it in the near future.

Farm buildings using USS Galvanized Steel Sheets have two basic advantages over other types of farm buildings. First, steel is much stronger and more rigid than any other construction material. The Galvanized Steel Sheets won't buckle or rip loose around fastening heads in strong winds, nor will they sag under heavy snow loads. Secondly, Galvanized Steel Sheets are much more fire resistant and have a much higher melting point than other farm building materials. Fire underwriters consider steel construction to be the safest of all. Moreover, steel buildings are easily grounded against lightning.

Buildings manufactured from USS Structural Steel and roofed and sided with USS Galvanized Steel Sheets offer the additional advantages of quick, easy erection, low maintenance cost, and top protection against wind, rain, and rodents. And, the roomy, clear-span steel buildings are versatile—ideal for every use from grain storage to poultry housing.

It will pay you to investigate Factory-Built Steel Farm Buildings, manufactured with long-lasting USS Galvanized Steel Sheets for roofs and walls, and a USS Structural Steel framework.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.



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Approximate size or capacity .....

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EASIER TO INSTALL. Fits any gutter length, any barn or stall setup.
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Cleans out manure for 4¢ a ton
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A REASONABLE down payment puts a Jamesway Shuttle-Stroke cleaner to work for you right now! And you have two years to pay . . . while it pays for itself. Here's how:

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The Jamesway Shuttle-Stroke cleaner is easier to install; cheaper to maintain. Fits any barn or stall arrangement . . . cleans better . . . does a million pounds of lifting every year for just 4¢ a ton.

See this Power Choring Shuttle-Stroke cleaner along with the complete line of Jamesway hog, poultry and barn equipment at your Jamesway dealer's now. For his name or further information write the JAMES MFG. CO., Dept. FQ-36, c/o your nearest branch office.

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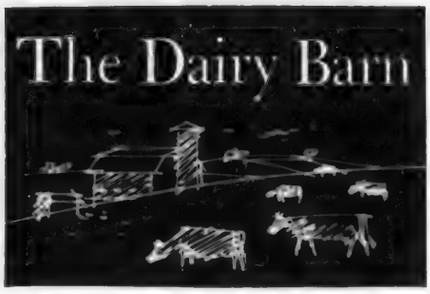


Bulk Tank— $1 Per Year

The prediction has been made that on most dairy farms in probably no more than five years the milk can will be relegated to the same cobwebbed corner as the horse collar. From such a prediction it might be assumed that times will grow progressively tougher for the milk producer who will now be put to the considerable expense of installing a bulk tank. But that ain't necessarily so.

About a year ago one Midwest dairy decided to convert to a completely bulk operation. To do this it offered its producers an arrangement that may soon find acceptance in other dairy regions. The arrangement is this: Producers with a herd of at least 25 cows or a low-month output of not less than 10,000 to 12,000 pounds of milk were given the opportunity to lease a bulk tank from the dairy at an annual rental of $1 per year. Those producers who did not want to convert to the bulk arrangement or whose small herds made them ineligible were assisted to switch to another handler.

Under the contract between the dairy and the farmer the dairy installs a brand new bulk tank free of any charge except the $1 rental fee. The dairy pays for the cost of installation and retains title to the tank. The farmer signs a contract in which he guarantees to deliver his milk to the dairy for the next nine months; after that the contract is on a 30-day basis.

The producer receives the benefit of the reduced hauling rates which apply to bulk handling, but he forfeits the premium usually paid for bulk milk unless he purchases the tank himself.

These installations consist of nothing but the tank and cooling unit. If the farmer wants a pipeline milker it is up to him to put up the additional capital.

During the first year of its experiment the dairy has been able to switch completely to a bulk operation, has had only one dissatisfied producer from whom it has reclaimed a tank.

All milk handlers do not find themselves equally prepared to offer this kind of a deal to their producers. If they are faced with the necessity of installing new can-handling equipment or making other improvements in their receiving room facilities, or if their processing equipment is such that it functions best with milk within a limited range of temperature, they may find it more economical to enter

(*Continued on page* 135)

This year give yourself a $1,000.00 raise!

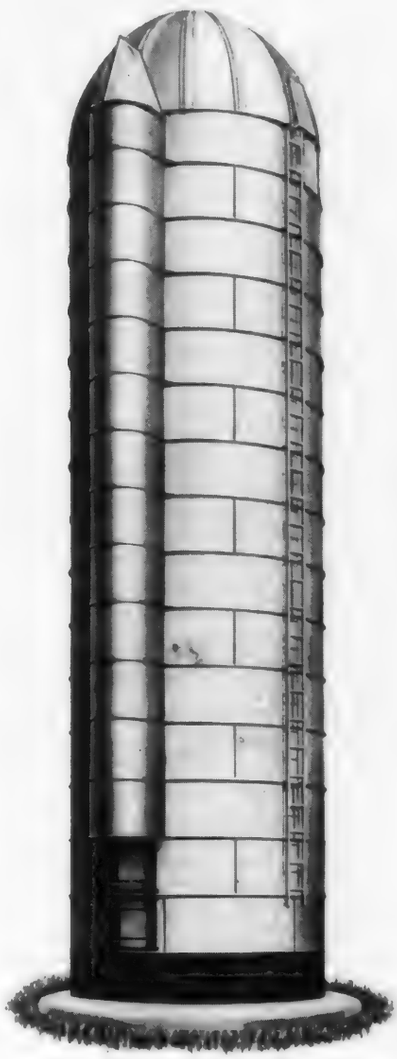
JOIN THE BIG SWING TO

GRASS SILAGE

WITH A NEW PAY-FOR-ITSELF

SILVER SHIELD

SILO



There's a good reason for the big swing to grass silage farming. And it's simple: grass silage is today's best way to beat high feed costs and low market prices. It's today's best way to make more money from your land. That's why today, more than ever before, *you need a C&L Silver Shield*—the silo proved best for grass silage.

You can actually add $1,000.00 more to your income this year with a Silver Shield. Here's why! The Silver Shield is completely air tight. There's never any moldy, spoiled or dried out silage. Rich silage juices can't leak through or be absorbed. The reason is Silver Shield's rugged all-steel walls—which also resist the corrosive silage acids that can dissolve the lime in concrete silos and the mortar joints of tile silos. What's more—the smooth, even surface of a Silver Shield Silo lets silage settle and pack perfectly. You get the fullest nutritional value from your silage—more feed for every dollar.

Many other advantages, too! Longer silo life, lower cost over the years, and minimum maintenance, easy erection, easy unloading, *easy financing*, too. Get all the facts, and you'll swing over to profit-making grass silage farming *this year*—with a Silver Shield Silo that can pay for itself out of added profits in just two or three years. Made by Clayton & Lambert Manufacturing Company, manufacturer of C&L Silver Shield Silos, bulk storage bins, grain bins, and corn cribs; and Buckeye cribs and bins—America's most complete line of feed storage buildings for your farm.

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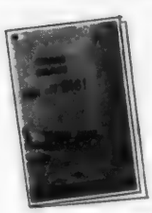

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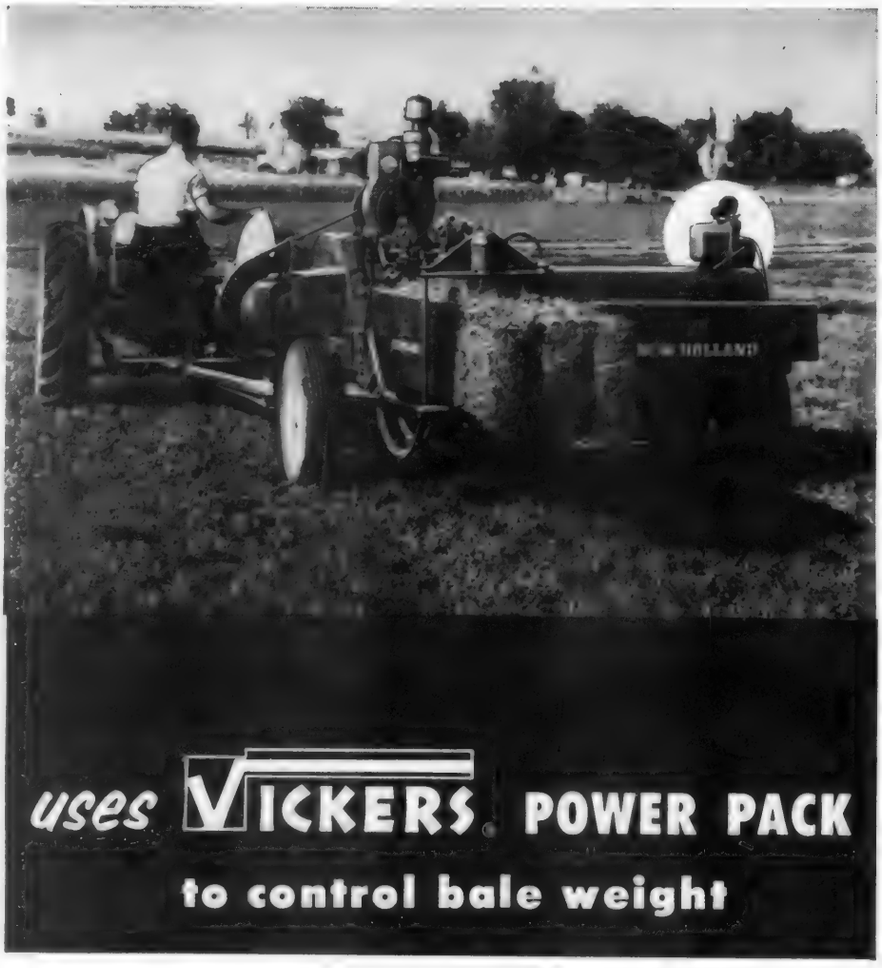
CITY_____ ZONE____ STATE_____

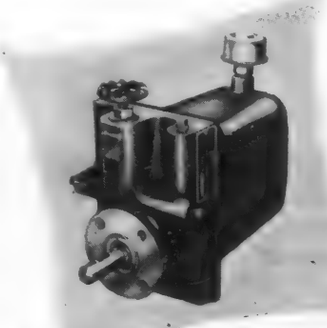
I have_____ cows in my herd and expect to grow to_____ cows.



Among features available on the New Holland Model 66 Twine-Tie Baler is "Hydraformatic" . . . the first hydraulic bale tension control system. This system (powered by a Vickers Hydraulic Power Pack) automatically produces bales of uniform selected weight. A simple turn of the hand-wheel on the Power Pack (see below) adjusts tension to give the bale weight wanted regardless of type of material being baled.

This is another example of the many ways in which Vickers Hydraulic equipment is working on the farm . . . helping make a wide variety of jobs easier, quicker, more economical. The next time you buy farm machinery, it will pay you to make sure the hydraulic units are Vickers.

VICKERS® *Hydraulic* POWER PACK

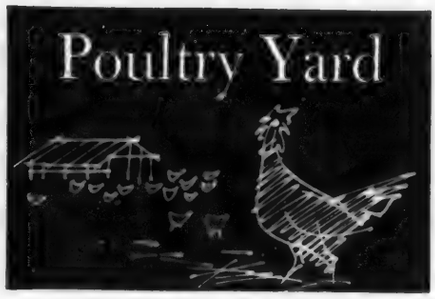


This convenient and compact "package" consists of pump, overload relief valve, oil tank and filter. The Vickers Vane Type Pump is hydraulically balanced and has automatic wear compensation . . . delivering more oil while taking less power . . . having much longer life with minimum maintenance. Entire hydraulic system is protected against overload.

People who look for quality look for VICKERS.

6750

VICKERS INCORPORATED • 1534 OAKMAN BLVD., DETROIT 32, MICH.
DIVISION OF SPERRY RAND CORPORATION
Application Engineering Offices • ATLANTA • CHICAGO • CINCINNATI • CLEVELAND • DETROIT
HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N.J.)
PHILADELPHIA AREA (Media) • PITTSBURGH AREA (Mt. Lebanon) • PORTLAND, ORE. • ROCHESTER
ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA • WASHINGTON
WORCESTER
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



The Poultry Outlook With all of the hedging, perhapsing, and probablying that a prophet must do, the agricultural economists of the United States Department of Agriculture have predicted what to look for in the poultry field for the coming year. Their prediction might apply to almost any farm product today—egg and broiler production increasing above the record levels of 1955, turkey production going higher than 1954, which was an all-time high for turkeys; demand remaining quite strong, but prices dropping slightly.

Hens Hike Production Like hybrid corn and farm labor efficiency, hens are doing a better job per bird than their ancestors did. In 1954, with only 10 per cent more hens than we had in 1930, we produced 67 per cent more eggs. Our hens also produced more evenly over the entire year. Here is a comparison of eggs laid by the average hen in each quarter of the year:

	1st three months	2nd three months	3rd three months	4th three months
1930....	29	47	31	15
1954....	47	54	44	41

New Wrinkle in Turkey Selling Arno Weidner, of Seguin, Texas, has developed a market which is getting rid of a sizeable number of unplucked, unevicerated turkeys. A typical pattern for selling these birds is as follows: Weidner lays a killed bird on the ground, the customer aims at it with his shotgun and fires. He then throws the buck-shot filled bird into his car and drives home. "Just another poor hunter who can't face the wife with an empty game-bag," is Weidner's explanation.

"Selling birds with buck-shot in them," Weidner says, "reminds me of the lady who bought a bird from an old fellow around here and later complained to him, 'I thought you said that was a tame, farm-fed bird. That bird had shot in him!' 'Oh, it was a tame bird alright;' the old boy said, 'that shot was meant for me.' "

Weidner gets the hunters going and coming. "Some of the hunters, headed for the hill country above San Antonio stop by the farm and buy a few turkeys to stake out. A turkey tied to a stake, particularly a hen that is about to begin laying eggs, makes a real loud racket that attracts the wild birds."

Hunters are, of course, not the only

(*Continued on page* 135)

B.F.Goodrich on-the-farm tire inspection month

LOOK AT THESE FREE SERVICES

Protect yourself from the expense and inconvenience of unnecessary tire failures during the busy days ahead. Take advantage *now* of B. F. Goodrich On-the-Farm Tire Inspection Month!

Any time during the next month your nearby B. F. Goodrich Service Man will come out to your farm to inspect all your tires, regardless of make. His services are absolutely *free*, place you under no obligation. Get ready for spring work now by having your B. F. Goodrich Tire Service Man:

1. **Check all your tires and recommend proper air pressures.** A correctly inflated tire gives you maximum life and efficiency.
2. **Point out tires that may fail during the heavy work season.** Only tires in good condition can stand the strain of rugged work schedules.
3. **Recommend proper liquid weighting for tractor tires.** New B. F. Goodrich portable pump makes liquid weighting an easy, fast job, assures you of full traction when you need it.
4. **Check steel-wheeled equipment to see if savings can be made by changing over to rubber.**
5. **Advise you on possible savings to be made by recapping worn but serviceable tires.**

Highest trade-ins of the year!

See your B. F. Goodrich retailer!

To celebrate On-the-Farm Tire Inspection Month, B. F. Goodrich is offering the highest trade-in allowances of the year on your worn tractor tires! Check with your B. F. Goodrich retailer and find out how much your tires are worth toward the purchase of a set of big, new B. F. Goodrich Power-Grip tractor tires.

Power-Grip tires have bigger shoulders, bigger cleats. No other tire is wider or has more cleats. This means Power-Grip tires take a big bite of the soil, give you maximum traction in forward or reverse. Power-Grip cleats are higher at the shoulders to penetrate deeper, braced at the base to wear longer. The result: these B. F. Goodrich tires give greater drawbar-pull, speed your tractor work.

What better time to talk to your nearby B. F. Goodrich retailer than during On-the-Farm Tire Inspection Month. You'll find your B. F. Goodrich retailer listed under Tires in the Yellow Pages of your phone book. Or mail the coupon.

B.F.Goodrich

THE B. F. GOODRICH CO.
Tire & Equipment Div., Dept. F-565
Akron 18, Ohio

I would like to have a FREE On-the-Farm Inspection made of my tires.

Name_____

R. R._____ Town_____

County_____ State_____

How a FITCHBURG *Farm* CHIPPER CAN SAVE YOU

Time

Labor

Wages

and give you DAIRY BEDDING, MULCH, POULTRY LITTER

Farming today is big business—time is money. And only labor saving machines that pull their own load—save you time, labor, and do a job that would ordinarily cost you wages are found on most modern farms.

Fitchburg Farm Chippers save you

TIME—FITCHBURG FARM CHIPPERS chip up and dispose of waste wood *instantly*. You can get rid of fence row clearings, clean up your woodlots (reducing the fire hazard caused by dead branches) quickly and simply with very little effort.

LABOR—One man can operate a FITCHBURG FARM CHIPPER with ease. The Fitchburg Safety Spring makes operation equally easy with all sizes of wood (to the machine's rated capacity), and a hired man can clean up a large woodlot just as fast as he can throw poles and branches onto the spring-activated feed plate.

WAGES—A FITCHBURG FARM CHIPPER can easily do the work of several men all working at top speed. It can work constantly and, of course, without fatigue. Wages saved can soon pay the low cost of a FITCHBURG FARM CHIPPER.

In addition you get excellent free

DAIRY BEDDING—Wood chips for dairy bedding are highly absorbent and have excellent holding properties. Purdue University says "Shredded wood chips used in bedding tests in the Purdue dairy barn stayed in place better than straw, ground corn cobs, or shavings. Next to straw, chips were the cheapest bedding."

MULCH—Wood chips really pay off as top quality mulch for gardens and fruit trees. For orchards, chip prunings and thinnings right on the spot and leave the highly absorbent chips around the base of your trees as moisture holding mulch. No carting, burning, or hauling in sod mulch.

POULTRY LITTER—Wood chips make excellent low cost poultry litter ideal for shallow or built-up manure pack. Chips are highly absorptive, reduce odors, are dust free, "scratchable." Excellent for use, after mixed with manure, as soil amendment. Will not clog your manure spreader.

What about maintenance?

FITCHBURG FARM CHIPPERS are designed for the rugged use they get on modern farms. These sturdy machines are built to work the same long day you work, day after day, year after year. Only routine maintenance, such as lubrication and sharpening of the extremely tough and durable cutting knives should be required. You get a written one year guarantee with your FITCHBURG FARM CHIPPER. Send coupon for a copy of this guarantee. Know what you get before you buy.

How much does a Fitchburg Farm Chipper cost?

Best news of all! You can own a FITCHBURG FARM CHIPPER for as little as $960. Figure out how much labor you could get out of $960 worth of wages at today's prices, and figure out how much this amazing, time-saving, labor-saving machine can save you *even the first year!*

FITCHBURG ENGINEERING CORPORATION Fitchburg, Mass., Dept. FQ-36

Mail this coupon for specifications and literature

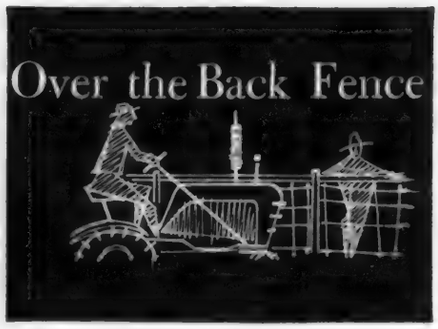
Please send specifications and literature on FITCHBURG FARM CHIPPERS.

☐ Please send copy of FITCHBURG one year guarantee.

(Name) .....

(Address or R.F.D. #) (Type of Farm) .....

(Town) (State) .....



Elephant Voltage If you can't control pigs by electric fencing, you either don't know how, or your pigs are too smart for you. An English engineering firm has worked out a system for controlling elephant, rhino, buffalo and other large African livestock; and if an elephant can be persuaded to respect an electric fence, there should be no trouble with pigs. The English fence makers confess they've come a cropper when it comes to giraffes—they go right over or through a fence that a rhino will hesitate to tackle. If you have an odd elephant or buffalo you want to confine, write Wolseley Engineering, Ltd., Electric Avenue, Witton, Birmingham, 6, England.

Differential Lock Resurrected In plowing, the land wheel of a tractor will often slip more than the furrow wheel, especially in loose soil or on heavy green cover. Frequently, this slip is so pronounced that the wheel digs a continuous rut from one end of the field to another, while the furrow wheel leaves a clean imprint.

This difference in the wheels' performance is made possible by the differential. It is a difference which increases tire wear, decreases drawbar power and increases the consumption of fuel per acre.

Tractor designers were aware of this shortcoming of the differential long before tractors wore pneumatic tires and some of them overcame it by a differential lock. The lock fell into disuse largely because of the strain it imposed on the transmission. If the lock was not disengaged when the driver turned the tractor at the headland, the tractor either plunged into the fence or ditch or else scratched round somehow while putting a terrific strain on the gears.

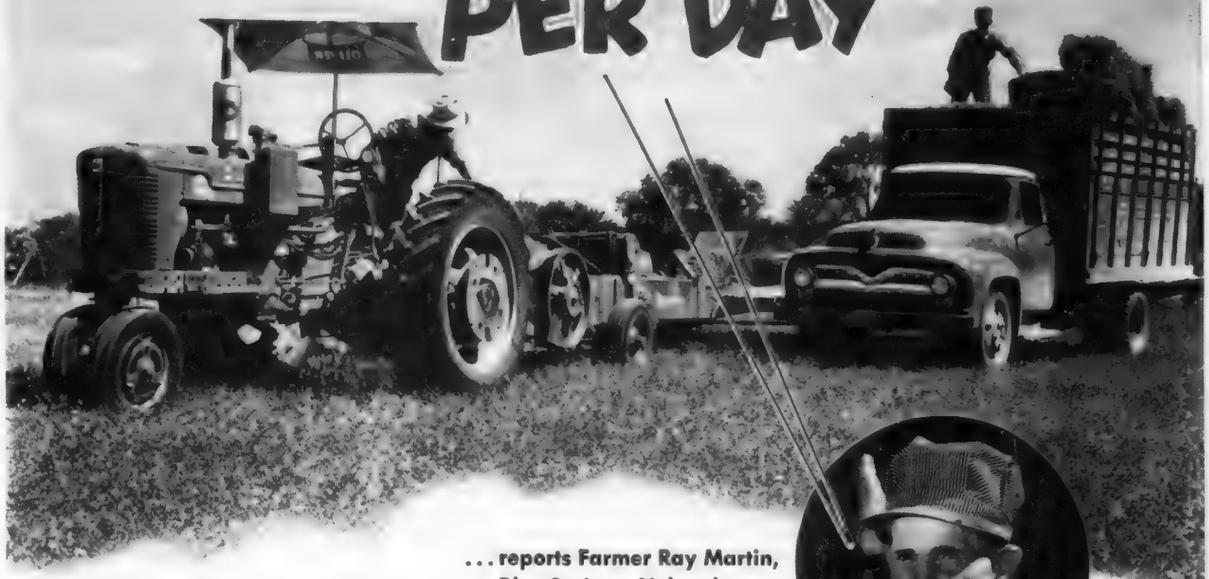
Now the differential lock is being resurrected and is part of the standard equipment of a number of new models. When turning the machine, the lock is disengaged simply by lifting the foot off the control pedal.

Bushels Vs. Pounds If American farmers get cocky about how progressive and scientific they are, they can humble themselves by contemplating the bushel basket. Almost every civilized country except our own has discarded the

(*Continued on page* 136)

"An Eaton 2-Speed Axle gives me

2 EXTRA PAYLOADS PER DAY"



. . . reports Farmer Ray Martin,
Blue Springs, Nebraska

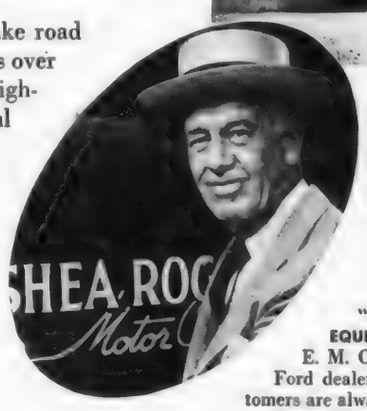
"AROUND HERE, there's not a minute to waste," says Ray Martin. "I've got 600 acres to farm . . . hay, wheat, corn and livestock to haul . . . a tough daily schedule to maintain. Only the best equipment, like the Eaton 2-Speed Axle, can take the steady strain and still help me work quickly and profitably.

"Eaton's low-gear range pulls a heavy load smoothly through soft ground, right in step with my self-propelled combine. In fact, I can haul 25 per cent more out of the field with an Eaton than I could with a conventional axle.

"With my Eaton-equipped Ford, I make road trips up to 200 miles. Most of the travel is over second-class roads. Despite that, Eaton's high-gear range hustles a full load at top legal speeds while engine RPM stays low. I get more miles per gallon and never have any maintenance problems. After topflight performance like this, I wouldn't think of buying a truck without an Eaton 2-Speed Axle."

Ask your truck dealer to demonstrate the money-saving versatility of the Eaton 2-Speed Axle.

"200 YARDS OR 200 MILES—an Eaton 2-Speed Axle is ideal for any hauling job," Ray Martin says. "Eaton's low-gear range makes field work faster, more economical. The high-gear range permits quicker, less tiring trips. And for reliable, trouble-free operation, no other axle can match the Eaton 2-Speed."



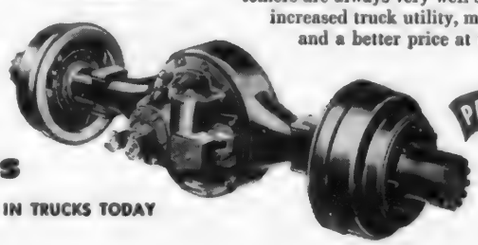
"WE'VE SOLD MORE THAN 500 EATON-EQUIPPED FORDS in recent years," reports E. M. O'Shea, O'Shea-Rogers Motor Company, Ford dealers of Lincoln, Nebraska, "and our customers are always very well satisfied. An Eaton assures increased truck utility, more work-saving efficiency, and a better price at trade-in time."

EATON

EATON MANUFACTURING COMPANY, CLEVELAND, OHIO

2-SPEED TRUCK AXLES

MORE THAN 2 MILLION EATON AXLES IN TRUCKS TODAY

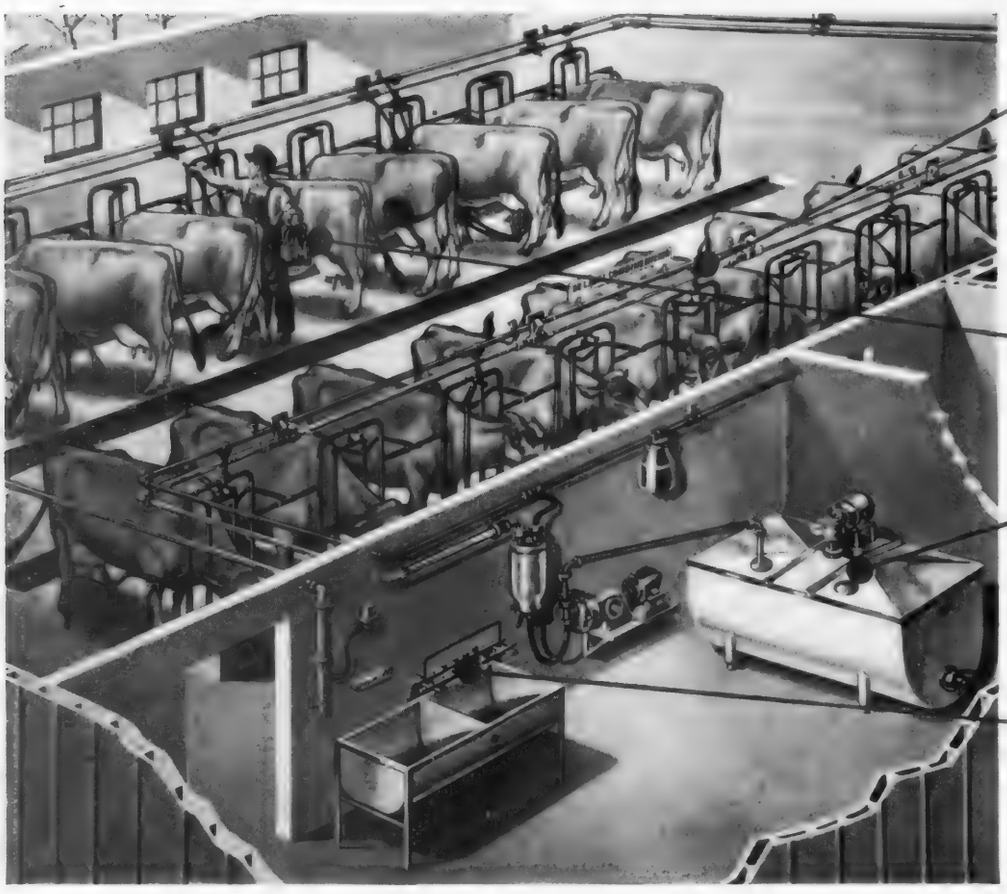


PAR

PROJECT ADEQUATE ROADS
Poor roads are dangerous and unnecessary. Back up the better roads program in your state.

How the DE LAVAL Complete Milking System

POINTS UP PROFITS!...



MOST UNIFORM MILKING!

...an exclusive De Laval feature is Magnetic Pulsation Control... the *only* control that gives you absolutely uniform milking!

MOST EFFICIENT HAND!

...De Laval's Claw and "Full-Flo" Teat Cups protect your cows ...gentlest ever...no tug, jerk or teat stretch!

MOST DEPENDABLE BULK TANK!

...ether vacuum or open type—designed and proved trouble-free...backed by De Laval, greatest name in dairying.

MOST ECONOMICAL IN-PLACE WASHING!

...Saves up to two-thirds of water and heating cost!...saves up to two-thirds of detergent!... means extra profits!

The De Laval Combine Milker®...delivering direct to a De Laval Bulk Tank ...insures peak profits...top efficiency...lowest production cost!

Find out the details of the money-making features... plus all the other features you get only in a De Laval Combine...features that mean a minimum of work with a maximum of milk production. See your De Laval Dealer...or mail this coupon today!

DE LAVAL

...SERVING THE DAIRY INDUSTRY SINCE 1878

THE DE LAVAL SEPARATOR CO., DEPT. 11-C
Poughkeepsie, N. Y.

Without obligation, send me proof that a De Laval Combine Milker and Bulk Milk Cooler can increase my milk profits.

I prefer ☐ Separate milking room ☐ Dairy barn installation. I milk about_____cows.

Name_____

Town_____RFD____State_____

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

STOP "SCOURS" IN CALVES AND PIGS

AUREOMYCIN®

AUREOMYCIN SOLUBLE is your best answer to the problem of "scours" in calves and pigs. With this powerful but gentle antibiotic, you can attack the disease *immediately.* It dissolves quickly and completely in water, milk or milk replacer.

Keep a supply of convenient, easy-to-use AUREOMYCIN SOLUBLE on hand ready for instant use. And for individual doses, AUREOMYCIN TABLETS are economical, handy and effective. See your veterinarian, druggist or feed dealer. Write for free literature.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
PEARL RIVER NEW YORK

Lederle

e Golden Antibiotic More Effective Against More Diseases . . . . . AUREOMYCIN

Chlortetracycli

MASSACRE IN THE CORNFIELD

UNDERGROUND PESTS are lying in ambush to massacre young corn. By cutting off the roots, they prevent the growing plant from getting proper nourishment, and the first stiff breeze that comes along will topple the stalks. Expensive replanting in the spring or difficult harvesting in the fall is the result.

But aldrin, a powerful insecticide, gives farmers a potent weapon against soil insects such as corn rootworms and white grubs. Aldrin also controls wireworms, seed corn maggots, cutworms, seed corn beetles, and cornfield ants. *All* major soil pests succumb to aldrin, properly applied to soil.

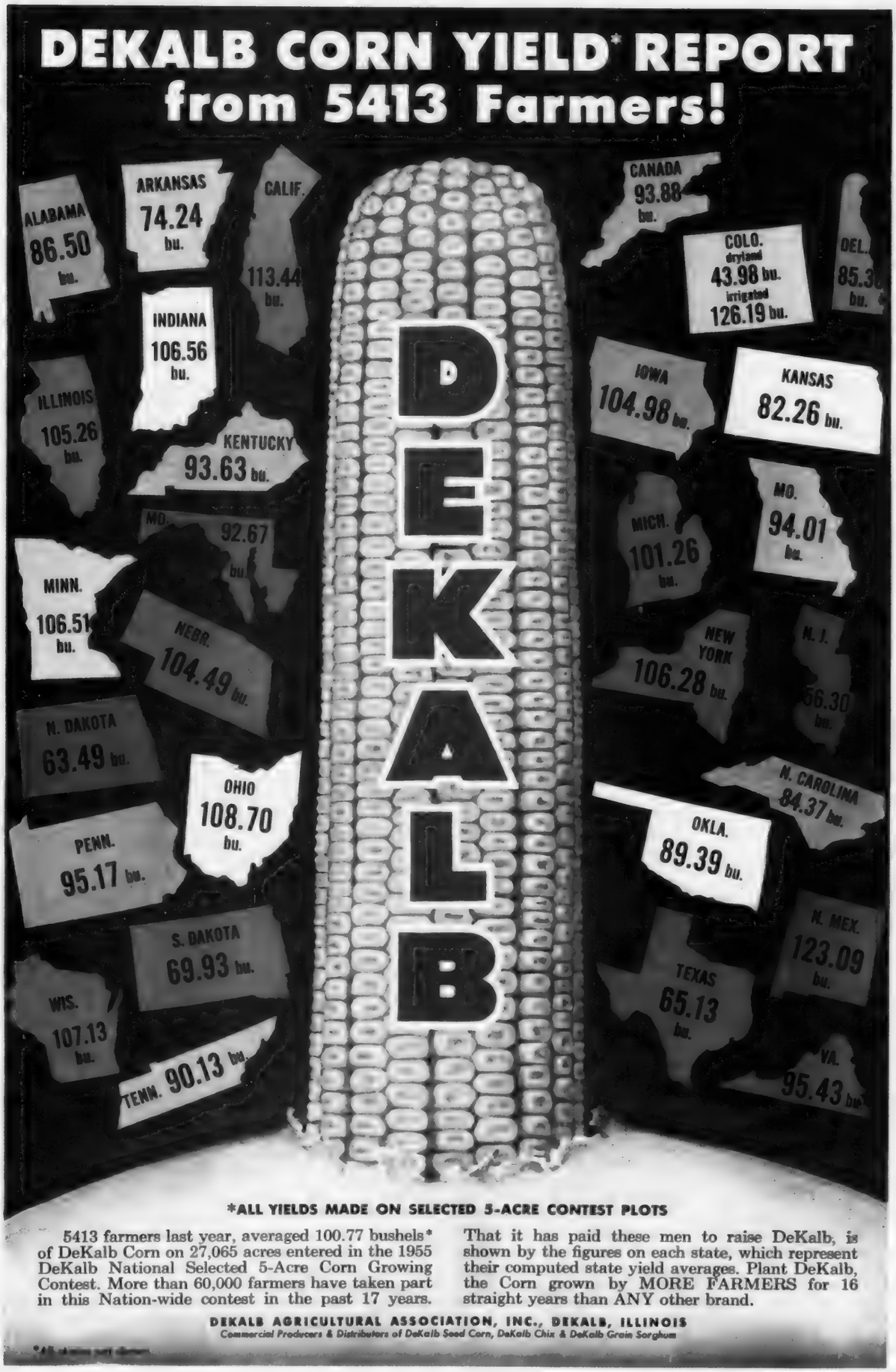
Aldrin is available under well-known brand names from your insecticide dealer. See him today.

aldrin

SHELL CHEMICAL CORPORATION

Agricultural Chemicals Division • 460 Park Avenue, New York 22, New York

SHELL



*ALL YIELDS MADE ON SELECTED 5-ACRE CONTEST PLOTS

5413 farmers last year, averaged 100.77 bushels* of DeKalb Corn on 27,065 acres entered in the 1955 DeKalb National Selected 5-Acre Corn Growing Contest. More than 60,000 farmers have taken part in this Nation-wide contest in the past 17 years. That it has paid these men to raise DeKalb, is shown by the figures on each state, which represent their computed state yield averages. Plant DeKalb, the Corn grown by MORE FARMERS for 16 straight years than ANY other brand.

DEKALB AGRICULTURAL ASSOCIATION, INC., DEKALB, ILLINOIS

Commercial Producers & Distributors of DeKalb Seed Corn, DeKalb Chix & DeKalb Grain Sorghum

Illustrated, the 21-inch Manor reel type trimming mower and Riding Sulky attachment, by Jacobsen

There's something about a beautiful lawn....

As a charming stage setting for easy outdoor living, a verdant show case to display your home to perfection, your lawn demands smooth, clean-cut grooming.

To achieve this distinctive appearance, a power mower by Jacobsen has been the choice of those who accept nothing less than the finest. Yet this precision made equipment is within the means of all who appreciate a beautiful lawn.

Only Jacobsen, with specialized knowledge of lawn care accumulated since 1921, provides such a wide selection of Power Lawn Tools to meet every need of terrain or turf.

For the reel or rotary mower suited to your lawn, consult your Jacobsen dealer, a reliable authority who has been carefully selected for his experience and standing in your community. Look under "Lawn Mowers" in the classified section of your telephone directory for Jacobsen nation-wide sales and service.

JACOBSEN MANUFACTURING COMPANY
MAKERS OF FINE POWER LAWN TOOLS FOR HOME AND PROFESSIONAL USE
DEPT. FQ3, RACINE, WISCONSIN

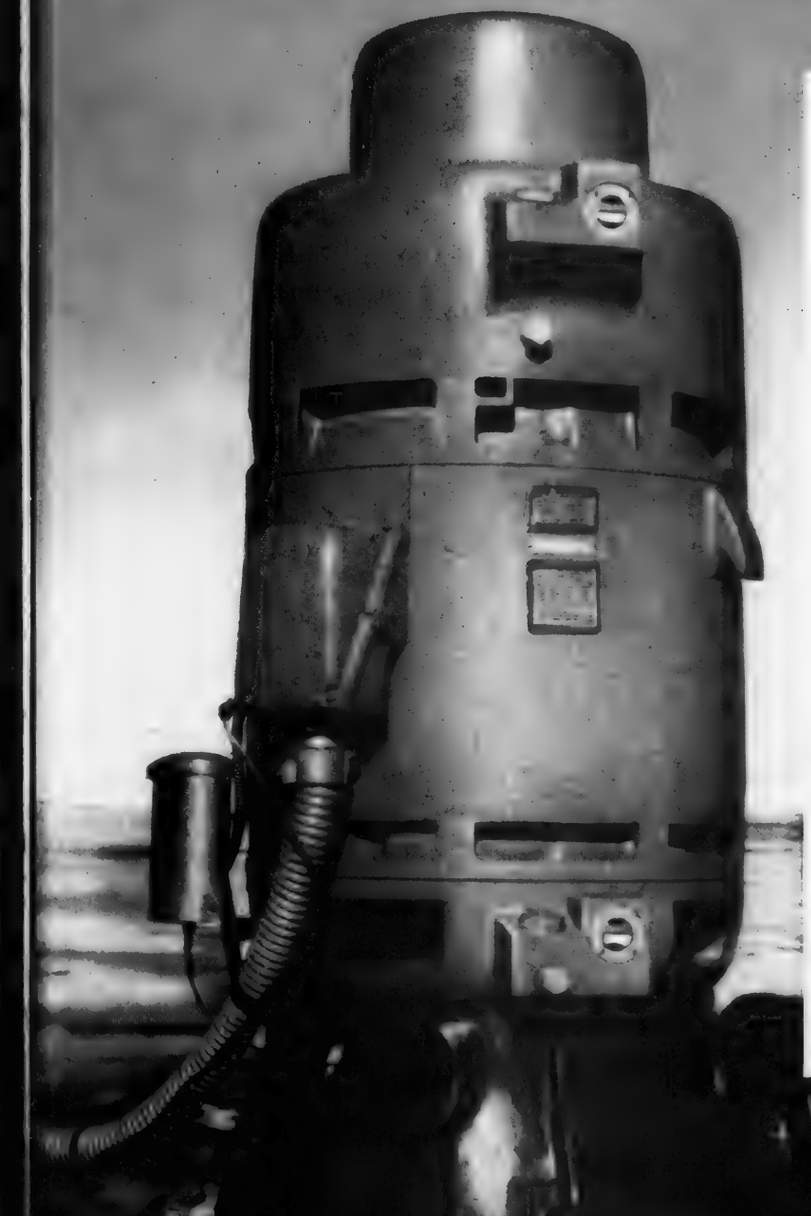
Jacobsen

JACOBSEN JOHNSTON WORTHINGTON

SUBSIDIARIES: JOHNSTON LAWN MOWER CORPORATION, BROOKHAVEN, MISS. WORTHINGTON MOWER COMPANY, STROUDSBURG, PENN.

New G-E Irrigation Motor

Runs for years without overhaul . . . needs only 20 minutes' maintenance a season



General Electric's new Tri-Clad* motor for irrigation pumping has been specially designed to meet the needs of the irrigation farmer. It incorporates design improvements gained from 75 years' experience making motors for industry and the farm. Here's how it will save you time, money and labor:

OPERATES FOR YEARS OUTDOORS—You can count on your new G-E irrigation motor to operate up to ten years or longer without an overhaul: Sturdy cast-iron frame doesn't rust away, gives you all-weather protection; new insulating materials and protected openings give you year-round reliability and fewer costly breakdowns.

PRACTICALLY NO MAINTENANCE—Because of the new Vistamatic lubrication system you need spend only minutes servicing this motor: Easy-to-read sight gage instantly shows oil level in motor and extra large filler holes and drain plugs make it easy to change the oil. The number of relubrication cycles has been reduced: only twice a year on large motors and once every four years on smaller sizes. The G-E irrigation motor also makes possible the other advantages of modern electric pumping, such as low initial cost, push-button starting and economical operation.

Make sure you get all the benefits of modern electric irrigation. Insist on G-E motors next time you buy an irrigation system from your local dealer. 870-1

*Registered Trademark General Electric Co.

P.O. Box 1064
Schenectady 5, N. Y.
Medium Induction Motor Department
General Electric Co.

Please send me GEA-6280 giving more information on the advantages of G-E irrigation motors.

NAME_____

ADDRESS_____

CITY AND STATE_____

MY PUMP DEALER IS_____

Progress Is Our Most Important Product

GENERAL ELECTRIC

SCIENCE COMES TO THE FARM IN A FEED BAG

It may *look* like the same kind of feed you could have bought ten years ago.

It may carry the same familiar brand.

It may even come in the same kind of bag.

But few things have changed so much—or brought so much change to American Agriculture.

For inside a bag of today's scientifically blended feeds is the knowledge gained from years of fruitful research . . . at Agricultural Experiment Stations . . . in laboratories . . . on proving farms.

The carefully balanced vitamins, minerals, antibiotics and other health- and growth-promoting ingredients in today's fine feeds help you produce more meat, milk and eggs . . . in less time . . . on less feed . . . and with less risk than even the scientists themselves—until recently—ever dreamed possible.

By putting so many nutritional discoveries into practical form—and by making them available—the feed industry has helped American farmers cut weeks off the time it takes to raise a broiler . . . months off the time it takes to make a market-weight hog, turkey, or beef steer . , . has helped to raise egg production by a hundred eggs per hen, per year.

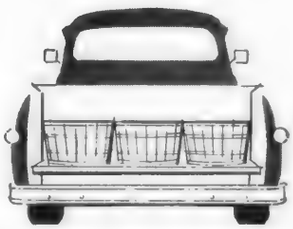
As America's progressive feed companies bring each new development of science to the farm in a feed bag they bring to *every* livestock and poultry producer the ability to better, each year, his own best production record for the year before.

And as a fast-growing nation looks to America's poultry and livestock producers for *still greater* food production in the future, you can look to your feed man to bring you the benefits of future research that will help make it possible.

From an address by John E. McKeen, President, Chas. Pfizer & Co., Inc.

INTRODUCING

the
world's hardest-working
easiest-going trucks
for the farm!

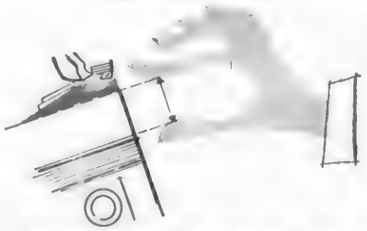


Widest low-floor pick-ups and stakes in the industry

29

BASIC MODELS

in ½-¾-1-1½-2 ton series; 912 options to fit sun-up to sun-down chores

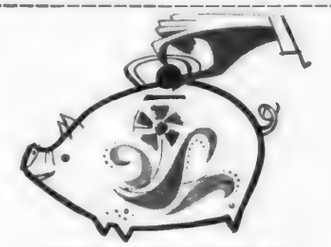


Shortest stroke V8—bar none! High-torque, low-friction payload power

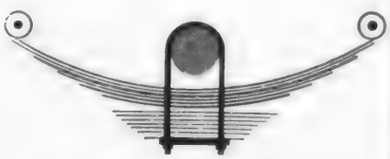
CHOICE OF

FOUR V8s

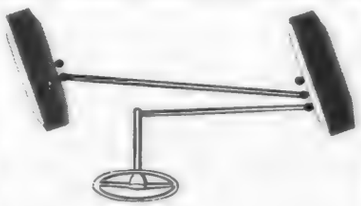
AND 2 SUPER-ECONOMY SIXES



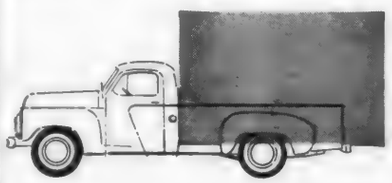
Year-in, year-out savings in gas and oil, maintenance



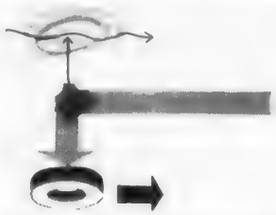
Two-stage rear springs improve the ride under heavy loads



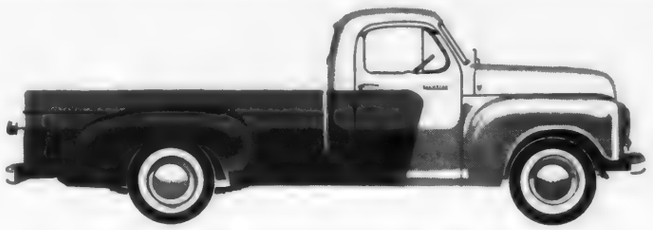
Cross-link, variable-ratio steering absorbs "wheel flight" over bumps



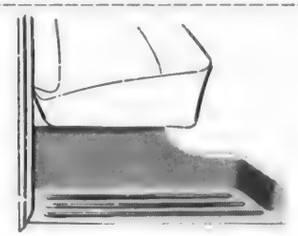
High payload-to-weight design with Studebaker's deep-frame chassis



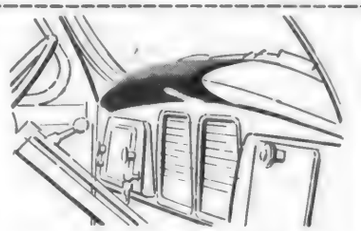
New Twin-Traction differential* for pulling through mud, sand, snow, ice!



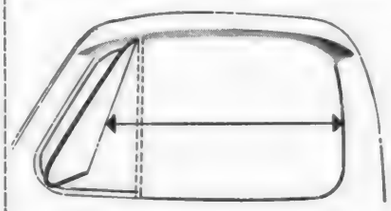
Transtar styling is handsome, practical and functional



Weather-protected safety door step



Sound-conditioned cab* with deluxe comfort, safety features



Shoulder-wide side window for close-quarter maneuvering

Extra cost equipment

star performers
with
saving ways

STUDEBAKER TRANSTARS

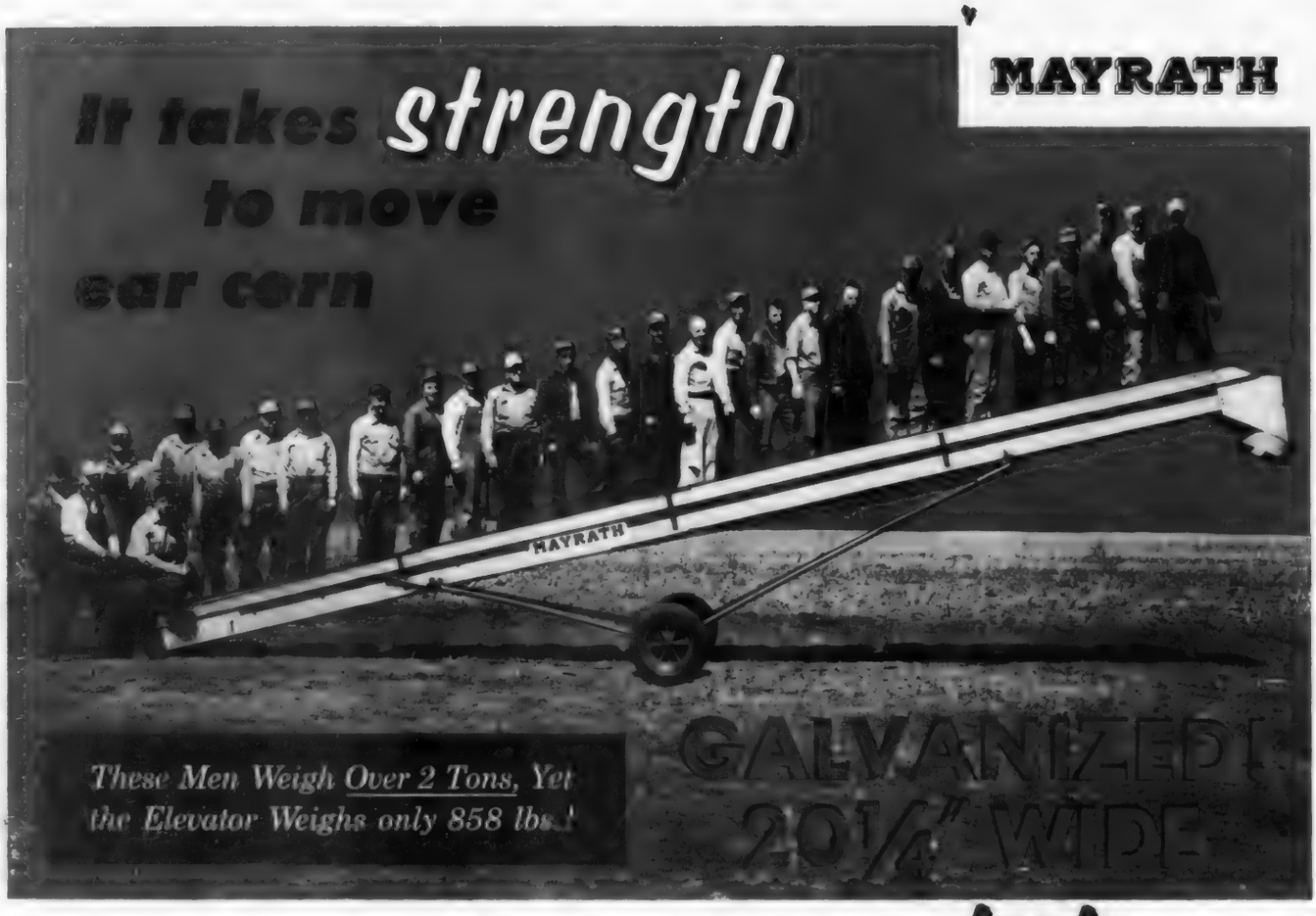
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

TUNE IN TV READER'S DIGEST EVERY WEEK

STUDEBAKER DIVISION OF STUDEBAKER-PACKARD CORPORATION—WHERE PRIDE OF WORKMANSHIP STILL COMES FIRST!

MAYRATH

It takes strength to move ear corn



MAYRATH *lasts*

This Mayrath elevator has travelled over 7500 miles, with no sign of damage.

MAYRATH *tests its products*

The first 5 new 1955 Mayrath elevators were loaned to Illinois farmers* last spring. 4 of these 5 farmers bought the elevators voluntarily after they tested them, although all 5 farmers already owned other makes of elevators.

Mayrath runs its products until worn out. *Augers being tested day and night, moving over a million bushels each.*

MAYRATH *has high resale value*

At various public auctions,* used Mayrath elevators have been sold at prices above or near their original *new* price.

*Names furnished on request.

Write for Name of Dealer Nearest You . . . **Write TODAY!**

MAYRATH

Dodge City, Kansas
Monmouth, Illinois

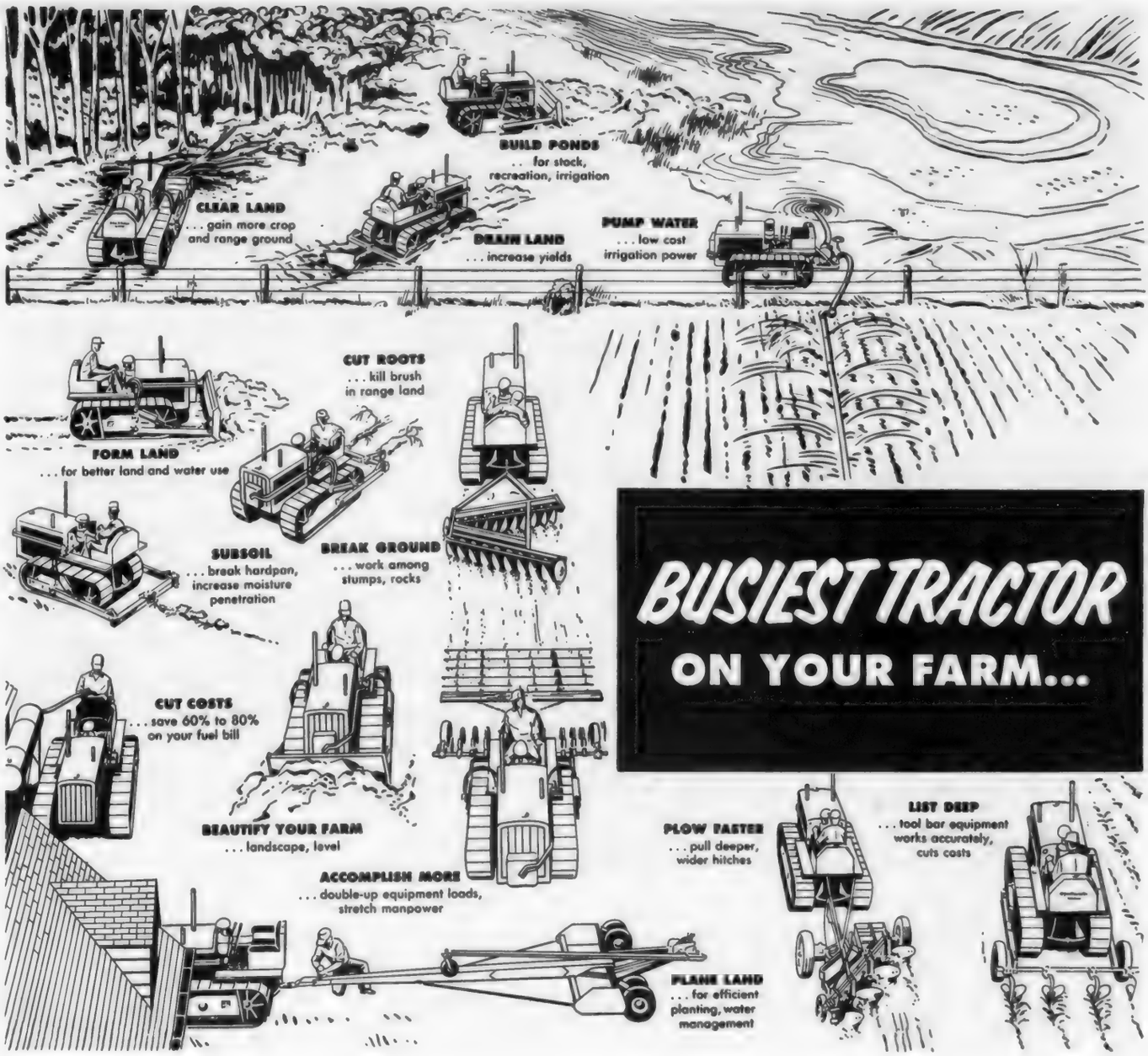
World's Oldest and Largest Maker of Auger Elevators

the **BEST** *you can* **BUY**

GALVANIZED!
20¼" WIDE

17 FT.... $138	33 FT.... $290
25 FT.... $235	41 FT.... $340

Auger prices complete with carriage and hitch


BUILD PONDS
. . . for stock, recreation, irrigation
CLEAR LAND
. . . gain more crop and range ground
DRAIN LAND
. . . increase yields
PUMP WATER
. . . low cost irrigation power
CUT ROOTS
. . . kill brush in range land
FORM LAND
. . . for better land and water use
SUBSOIL
. . . break hardpan, increase moisture penetration
BREAK GROUND
. . . work among stumps, rocks
BUSIEST TRACTOR
ON YOUR FARM...
CUT COSTS
. . . save 60% to 80% on your fuel bill
BEAUTIFY YOUR FARM
. . . landscape, level
ACCOMPLISH MORE
. . . double-up equipment loads, stretch manpower
PLOW FASTER
. . . pull deeper, wider hitches
LIST DEEP
. . . tool bar equipment works accurately, cuts costs
PLANE LAND
. . . for efficient planting, water management

Take a second look at the illustrations shown above . . . you can see that to do all these jobs you'd need an *extraordinary* tractor—and *that* describes a CAT* Diesel D2 Tractor! How many of these operations have you wanted to do on your farm—but never could because you were handicapped by inadequate power?

Then it's time you decided to start reaping the many extra benefits of Caterpillar ownership this spring! You get all the advantages of a *full* diesel when you own a Cat Diesel Tractor . . . you can burn low-cost No. 2 furnace oil, saving up to 20% over many diesels that require premium fuels. You get sure starting at any temperature with an independent gasoline starting engine, or a 24-volt direct-electric starting system.

Cut equipment investment by owning the exclusive swiveling Cat Tool Bar that you quickly swing to the front or rear for bulldozer or subsoiler, cultivator, chisel and ditcher operation.

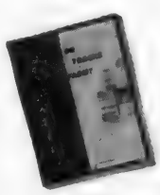
A demonstration by your Caterpillar Dealer will prove to you that you need a Cat D2 Tractor. Give it every test in every soil condition. Once you own a D2, you'll wonder how you ever farmed without it! See your dealer today!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

FARM TRACTORS
TOOL BARS & EQUIPMENT



FREE BOOKLET: *"Tires or Tracks" booklet shows the place of both Cat track-type Tractors and wheel tractors on your farm. Ask your dealer or write us for your free copy. Write Caterpillar Tractor Co., Dept. FQ36, Peoria, Ill.*

USE PLASTIC PIPE... MAKE SURE IT'S YARDLEY CLEARSTREAM
MORE WATER MEANS MORE MILK!
WE CAN LAY IT OURSELVES. IT'S PRESSURATED FOR OUR WATER SYSTEM!
YARDLEY-PIPED WATER WILL KEEP OUR MILKHOUSE SPIC AND SPAN!
HOT DOG! NO MORE WATER CARRYING! NOW WE'LL HAVE IT IN ALL OUR OUTBUILDINGS!
I'M SURE DELIVERING YARDLEY PIPE ALL OVER THE COUNTY!
HENRY, LET'S INSTALL RUST-PROOF PLASTIC PIPE ON OUR JET PUMP
WE HAD OUR YARDLEY PIPE LAID BY LUNCHTIME. DO MY CHORES IN HALF THE TIME NOW.

YARDLEY *ClearStream*® Plastic Pipe

PressuRated for Farm Water Systems

Install that new water system right now for more profitable operation . . . for better farm living. With ClearStream Pipe you easily supply all the water you need to your home, hen houses, dairy buildings, stock troughs and every other location to help improve farm production.

Yardley *ClearStream* PressuRated Plastic Pipe was developed for farm water systems . . . the first fully pressure-rated pipe made for this use.

Yardley ClearStream Pipe is made from DuPont Alathon Virgin Resin . . . an improved pipe material recently perfected. You get higher permanent strength and uniform toughness . . . top resistance to weathering . . . flexible at temperatures to minus 70 degrees F. . . . 1/8th the weight of steel pipe.

Yardley ClearStream comes in 75-lb., 100-lb. and 125-lb. working pressures in all six sizes from ½ inch to 2 inches. Every length is guaranteed to meet rated pressure requirements with a substantial safety factor. Easily and quickly installed with a few simple tools. Long lengths and flexibility reduce the number of fittings . . . and once it's in, it's there to stay. It never rots, rusts or corrodes. Available through your dealer in lengths up to 400 feet. Look for the pressure rating and the ClearStream name stamped on every length and package. For service lines or pump pipe insist on genuine ClearStream. Send for literature.

Look for this Identification on every package and reel.

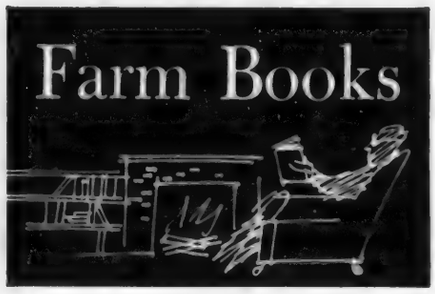
M-22 Twin-du-it for Jet Pumps

M-21 Sub-du-it for Submersible Pumps

YARDLEY PLASTICS CO., 142 Parsons Ave., Columbus 15, Ohio

In Canada: DAYMOND CO., LTD., Chatham, Ontario — Export Sales: F. & J. MEYER, 115 Broad St., New York 4, U.S.A.

Farm Books



The Complete Medical Guide, *by B. F. Miller. Simon and Schuster, New York, $4.95.*

When some people have a question they can't answer, they write to the President of the United States. The President, being a somewhat busy man, routes these letters to experts. During 1944, when he was a Major in the Public Health Service and also convalescing from a serious illness, Dr. Benjamin F. Miller was given the task of answering letters on health problems for President Roosevelt. It was this experience which made him realize the need for a complete medical guide for the layman.

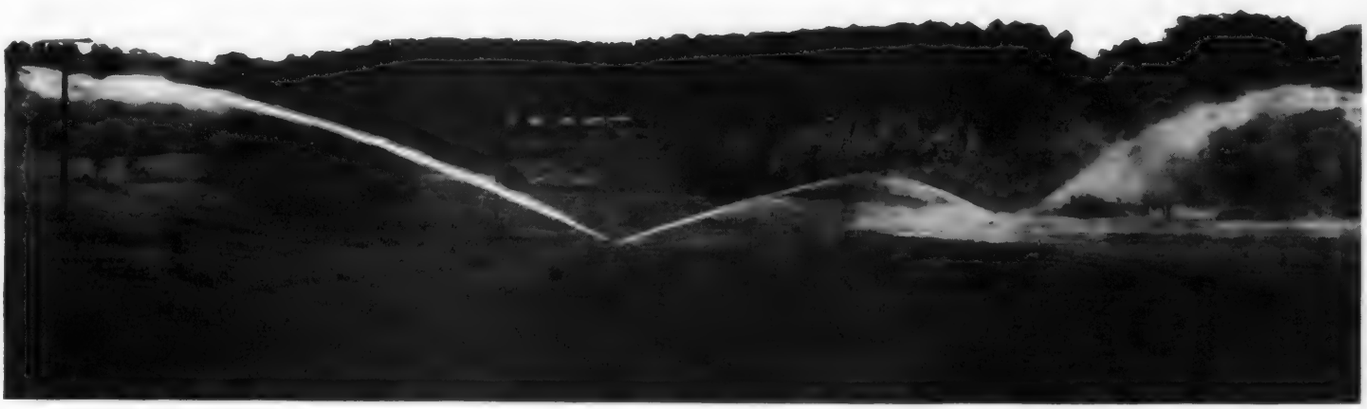
Dr. Miller's 913 page book, which is as comprehensive as any layman will ever need, is the result of 12 years work. With his Public Health Service background as well as having been lecturer on medicine at the Harvard Medical School, senior associate physician at the Peter Bent Brigham Hospital, and director of the May Institute for Medical Research, Dr. Miller is well aware that a book cannot take the place of the family doctor. He is equally sure, however, that no doctor has the time to sit down with each patient and teach him the fundamentals of preventive medicine, child care, mental health, first aid, home nursing, and the recognition of early symptoms which warn us of the coming illness. In this field, Dr. Miller's book satisfies a real need.

The book, which is written in a clear friendly style for adults, is divided into five major sections. "You and your body," the first section, deals with the general care of the body, an explanation of its functions, and such general problems as overweight, diet, skin conditions, and the like. In this section is a special discussion of the special medical problems of farmers. "You and your mind" takes up the problems of mental health and contains a most interesting discussion on the various methods of treating the sick mind.

"You and your home" will probably be the most often read section of this book. Here, Dr. Miller deals with the care and diseases of children, first aid, nursing in the home, and an important discussion of pregnancy and childbirth which includes a subsection on birth control. In writing the fourth section of his book, "You and your doctor," Dr. Miller was particularly well prepared since he has

(*Continued on page* 159)

Normal rainfall is NOT enough...



For top yields, make SURE with GORMAN-RUPP IRRIGATION PUMPS

Except in a few areas, 1955 saw normal rainfall all over the country. It was clearly evident that normal rainfall was *not* enough.

In a lower lakes region locality, in spite of near normal rainfall for the year, there was one crucial 18-day summer period when *no* rain fell—five other periods, 11 to 19 days each, when there was no *effective* rainfall. During each of these drought periods, crops were noticeably retarded.

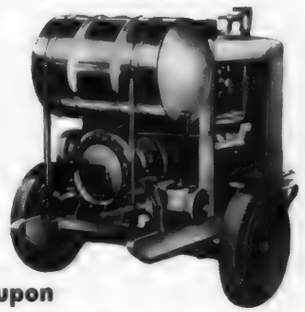
Sprinkler irrigation in any year will assure soil moisture content at maximum for finest yields. And Gorman-Rupp Irrigation Pumps—backed by the combined experience of more satisfied users than for any other make—offer the sure means of making your system the best for your individual needs.

Gorman-Rupp Irrigation Pump Dealers are prepared to provide you with a scientifically engineered plan for your farm. Their service also includes irrigation financing counsel and assistance.

Gorman-Rupp PUMPS

THE GORMAN-RUPP COMPANY
305 BOWMAN STREET
MANSFIELD, OHIO

Completely engineered units with lever-controlled automatic check valves, removable end plate, shaft seal under suction, large drum-type fuel tank—all with operational safety features. P.T.O. Driven: 3" and 4". Engine Driven: 80 GPM @ 80 lbs. to 1250 GPM @ 125 lbs.; for ditch irrigation, 3000 GPM @ 25 ft.



Mail this IMPORTANT coupon

THE GORMAN-RUPP COMPANY
305 Bowman St., Mansfield, Ohio

Gentlemen: I want an Engineered Irrigation Plan developed for my farm. Have your irrigation engineer contact me at no cost or obligation to me.

Name_____

Address_____ P.O._____ State_____

Irrigation Acreage Estimate_____ Acres

☐ Lake ☐ River ☐ Ditch ☐ Pond ☐ Well

Charolaise cattle are the largest cattle on earth

These are photographs, from France, of the fine bull, DIPLOMATE and the beautiful cow, FLATTEUSE. Our selective breeding program is designed to produce animals of this type and conformation.

The economic death knell of the small, over-fat, slow-growing beef animal has sounded. The beef animal of the future will have more meat, less fat, less bone and will grow to huge sizes quickly. The pure-bred Charolaise beef animal is this kind of beast; it is bigger and heavier than you can imagine and it gets bigger and heavier more quickly than you might believe possible.

It will be very many years before there are enough of these animals in the United States so that they can be raised for the commercial beef market, and, in the meanwhile, the demand for good breeding stock to establish breeding herds is so great that those persons who establish breeding herds now are assured of a demand for calves for many years to come. Our herd is one of the largest producers of pure-bred registered calves in the United States. We can offer you a wide selection of blood lines to start your breeding herd.

It is a nice experience in the cattle business to be able to sell ten times as many calves as you can raise. Start your breeding herd now and share this experience with us.

Write for descriptive booklet.

TURKEY RIDGE FARM

Member of the American Charolaise Breeders Association
Member of the American Charbray Breeders Association

JAMES CLANCY, Manager
MORRIS COHON, Owner

NEAR—PORTLAND, PA.
P.O. Box R.F.D. No. 1 Bangor, Pa.
Telephones: Twin Oaks 7-6545 and 7-6184

all-around time and labor saver...

the John BEAN ROYALETTE

multi-purpose high pressure sprayer

1. Spray fruit trees
2. Control livestock pests
3. Control mosquitoes around yard
4. Apply liquid fertilizers, control weeds
5. Spray row crops
6. Disinfect poultry houses
7. Clean dairy barns
8. Control brush
9. Control road dust
10. Whitewash buildings and fences
11. Clean farm implements
12. Control flies
13. Have emergency fire protection

No other equipment on your farm or ranch, excepting your tractor, can do so many jobs so well. The John Bean Royalette is equipment you'll use year around — a sprayer that will pay for itself many times over in hours of labor saved.

You'll value the Royalette's dependability, easy operation and low upkeep, too. Only the Royalette pump has lifetime Sapphite cylinders — so hard that spray materials can cause no wear. Pump pressures up to 400 lbs. are at your disposal — enough to drive through matted hair to cattle's hides, ideal for tough cleaning jobs, and ample for all types of boom and hand-gun spraying.

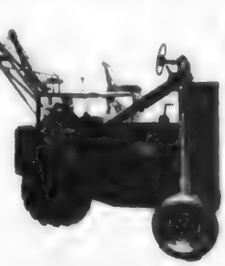
There's a wide range of Royalette pump and tank capacities to choose from; also a complete selection of spray booms and accessories. Ask your John Bean dealer, or use coupon below, to get details.

for the best news in sprayers, look to John BEAN

NEW

Hi-Crop

sprays high . . .
sprays low . . .
does the job fast.



NEW

AIRCROP

ATTACHMENTS

bring modern
air spraying
to every grower.

fmc

John BEAN

LANSING 4, MICHIGAN
SAN JOSE, CALIFORNIA

Division of Food Machinery and Chemical Corporation

Please send me complete details on

( ) Royalette All-Purpose Sprayers
( ) New Aircrop Attachments
( ) The Hi-Crop Self-Propelled Sprayer

Name_____

Address_____

Town_____ State_____

Buy beef and dairy feeds that

boost the value of roughage!

You unlock extra feed values when you feed concentrates containing PROCADIAN* Urea. It speeds up rumen activity that tears apart fiber and cellulose in hay, stalks, silage, fodder, cobs, chop and grain. The more nutrients your cattle can get out of low-cost roughage and other home-grown feeds, the lower your costs are for making meat and milk.

When you feed Urea nitrogen in a balanced supplement as a quickly-available source of protein—along with some quickly-fermentable sugars and starches, plus minerals—the rumen bacteria grow more rapidly and digest more of the fiber. More of the valuable feed ingredients inside the fibrous cell walls of feedstuffs are released to nourish your cattle. You get greater feed efficiency and more profits on meat and milk. Experience shows beef breeding herds also turn out better calf crops.

Many natural feeds, such as oats and alfalfa, have always contained some Urea. When you use balanced feeds containing PROCADIAN Urea, you provide plenty of this quick nitrogen source of protein that helps your cattle get more out of everything they eat.

See your feed man now for concentrates or balanced feeds containing PROCADIAN Urea. Look for Urea on the tag. And write to the nearest address below for the free booklet that describes how *urea* improves rumen nutrition.

*Trade-mark

PROCADIAN
UREA
FEED MIXTURE
The QUICK Source of PROTEIN in Mixed Feeds

NITROGEN DIVISION Allied Chemical & Dye Corporation
40 Rector St., New York 6, N. Y. • P.O. Box 98, Ironton, Ohio
P.O. Box 188, Columbia, Mo. • P.O. Box 166, Omaha 7, Neb.
6060 College Ave., Indianapolis 20, Ind.
P.O. Box 869, Kalamazoo, Mich.

NITROGEN DIVISION ALLIED CHEMICAL

Send me full information on PROCADIAN Urea
☐ in dairy feeds ☐ in beef feeds ☐ in sheep feeds

NAME_____
ADDRESS_____
CITY_____ STATE_____

Fill in this COUPON for the FREE BOOKLET

G-E GENERATOR (A) FURNISHES ELECTRIC POWER THROUGH SINGLE CABLE (B) FOR BALER MOTOR (C)

No PTO Shaft or Engine! Electricity Drives This Baler

Electrically powered farm machines are now a reality. International Harvester tractors equipped with Electrall*—General Electric's mobile power generator—provide a whole new source of portable electric power for the farm. They drive power-driven equipment . . . keep electrical household and farm equipment in operation during high-line outages . . . and power portable tools away from the farmstead. This new power source can help you now:

SAVES YOU MANPOWER because electrified equipment can do many jobs faster and safer. On the market is an electric motor-driven hay baler powered by the tractor-mounted G-E generator. It drives the baler smoothly at full capacity . . . saves hookup and maintenance time (the electric motor requires no fuel and little or no maintenance for as long as ten years). A single cable connects the baler to the G-E generator. Other power-driven farm equipment will soon be built to take advantage of portable electric power.

SAVES YOU MONEY because it gives you an emergency power supply, always at hand to keep milkers, coolers, freezers, and other vital equipment in operation. If regular power should fail, simply plug in your tractor-mounted generator to a "double-throw" switch installed at your house or barn.

SAVES YOU TIME because it acts as a portable "wall-plug," provides you with power anywhere. Portable electric tools can be taken out into the fields to make equipment repairs on the spot. Time-consuming jobs, such as digging post holes, sawing logs, trimming hedges, can be done with faster, more economical electric power.

FIND OUT MORE about how you can benefit from this big-capacity portable electric power source. A tractor without a built-in source of electricity is yesterday's design. Ask your farm equipment dealer now to demonstrate the advantages of tractor-mounted portable electricity. 872-1

*International Harvester Trade-mark

Progress Is Our Most Important Product

GENERAL ELECTRIC

EMERGENCY POWER is always at hand to keep vital farm equipment in operation.
Parkers' Dairy, Granville, N. Y.

PORTABLE POWER for an electrical "farm hand," like this welder, is available right in the fields.

P.O. BOX 1064
SCHENECTADY 5, N. Y.
MEDIUM INDUCTION MOTOR DEPARTMENT
GENERAL ELECTRIC COMPANY

Please send me a copy of your booklet, "Electricity on Wheels" (GEA-6400), showing the many uses of the mobile power generator. My farm equipment dealer is

_____

NAME_____

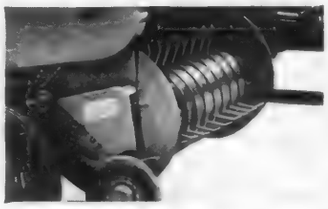
ADDRESS_____

CITY_____

STATE_____

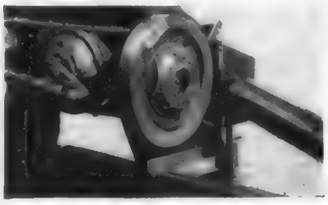
NEW DAY FARMING MEANS
Better Baling

Watch the bales roll out!



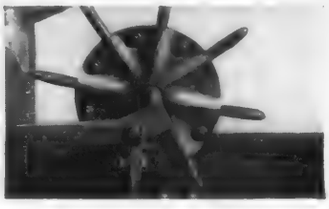
Gentle action saves leaves. Lifts hay only 24 inches and feeds it gently into the bale chamber. Fewer leaves are shattered. Result: more feeding value in every bale.

Twine fingers improve tying. You'll have less twine breakage, fewer loose bales with a Ford Hay Baler. Less wear and strain on the knotters, too. Fewer delays!



Safety clutch replaces shear pins — protects all gears from sudden shock loads and overloads. The saving in time and expense makes the safety clutch a valuable feature.

Tension bars for better packed bales. You get tight, well shaped bales of uniform weight throughout the field. Weight of each bale is kept constant whether windrows are thin or heavy.



Metering wheel controls bale length. Gives you a choice of bale lengths—36 or 42 inches. Choose the size of bale that best fits your needs.

Bale counter keeps tab — shows how many bales you've made. Helps on custom jobs, and for figuring yields on your own farm.

FORD
Hay Baler

New Day Farming calls for faster baling . . . lower cost baling . . . more feeding value in every bale.

You get all these advantages and more with a Ford Hay Baler. Just a glance at the features at left will tell you why more and more farmers consider the Ford 250 Hay Baler the top buy in the low-priced baler field.

It's worth a trip to your nearby Ford Tractor and Implement Dealer to find out more. Better yet, try a new Ford Hay Baler on your own farm, without obligation. Tractor and Implement Division, Ford Motor Company, Birmingham, Mich.

Ford Farming

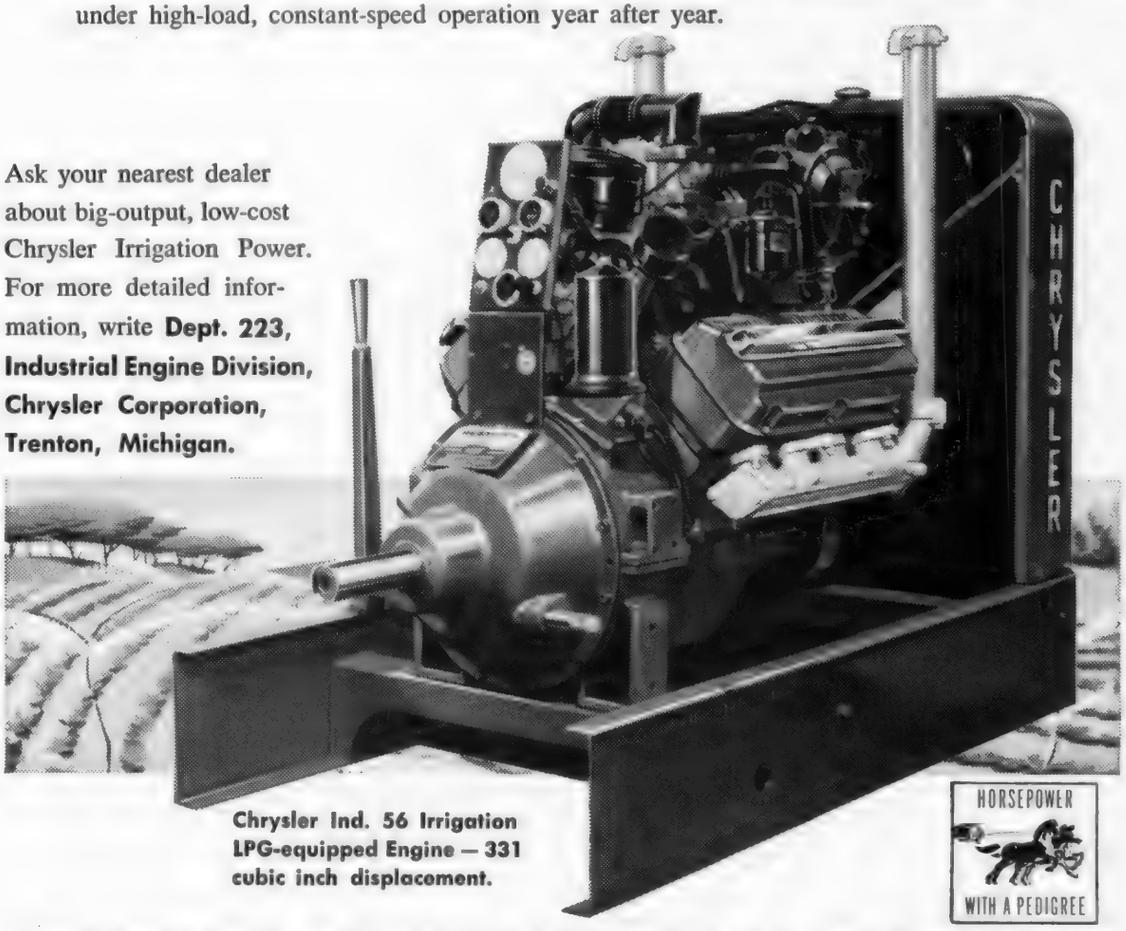
IS NEW DAY FARMING

CHRYSLER IRRIGATION POWER

delivers greater output at lower cost

Real workhorse power — that's what a Chrysler V-8 Industrial Irrigation Engine gives you! It pumps more gallons per minute than any other engine in its class. And it costs less than any other industrial engine even close to its power range. Costs less to operate, too — whether you use gasoline, natural or L-P gas. Maintenance costs are also much less — because this Chrysler Engine is designed and built especially for irrigation. Valves, crankshaft and bearings, for example, are engineered to stand up under high-load, constant-speed operation year after year.

Ask your nearest dealer about big-output, low-cost Chrysler Irrigation Power. For more detailed information, write **Dept. 223, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**



Chrysler Ind. 56 Irrigation LPG-equipped Engine — 331 cubic inch displacement.

HORSEPOWER WITH A PEDIGREE

CHRYSLER INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION / CHRYSLER CORPORATION

ONLY the quality *Harvey* "Red-Hed" has ALL three—

1. **QUICKLY-ADJUSTABLE SIDES FOR HANDLING ALL CROPS**
   You can close sides for small grain, keep them half open for ear corn, ¾ open for bagged material or fully open for baled hay!
2. **SPECIAL AGRICULTURAL ROLLER CHAIN FOR TROUBLE-FREE SERVICE**
   You won't have maintenance problems with this heat-treated high-strength chain. The Harvey's chain speed is 25 to 50% faster than most farm elevators, too!
3. **TOUGH ALLOY STEEL BODY FOR LONG, HARD SERVICE**
   You'll find it highly-resistant to rust and damage, yet light-weight for easy portability. Also, the balanced lifting frame is made of high-strength tubular steel.

There are many other good reasons why it's profitable to use a Harvey on your farm. Ask your dealer about this superior elevator, or send now for free bulletins.

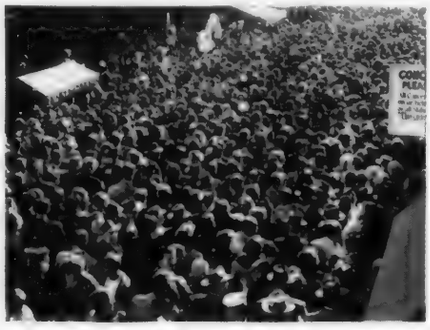
FARM TOOLS DIVISION
PITTSBURGH FORGINGS COMPANY
72 Thorn St., Coraopolis, Pa.

PITTSBURGH VULCAN RODERICK LEAN HARVEY
—the quality line of tillage and materials handling tools

Our Anniversary

TEN YEARS AGO the first issue of THE FARM QUARTERLY appeared on the newsstands of the nation. As we prepare this, our anniversary issue, we can't help looking back over those years of change in the American farm scene. In that first issue was an article on "How to Buy a Work Horse". It had its value then, for there were over eight million horses pulling plows and wagons on our farms—today there are less than a million and a half.

Since that first issue the national population has grown from 141 million to 168 million. With more mouths to feed, the farm population has shrunk from 26 million to 22 million—the actual workers on farms dropped from 10 to 8 million. How have we managed to increase from 14 to



. . . . Millions more to feed!

19 the number of non-farm persons fed by each farm worker? One of the answers certainly lies in the use of machinery, which has tripled for each farm during this decade. Other reasons for increased production we can see as we thumb through the ten volumes we have published.

Fertilizer use has tripled during this period, but new chemicals and biological products which were unknown when we first went to press have also played a large part in this great change. A whole family of insecticides has grown from the war-born DDT. In the weed-killing field we have selective weed killers which destroy our plant pests and spare our crops. Sprinkler irrigation, which has doubled the yields on many Midwest farms, was in its infancy when Volume 1, No. 1, of THE QUARTERLY was planned, and, frankly, none of us had ever seen a system in operation at that time. Today, when you fly over the Midwest in the summer months, you'll see corn, alfalfa and almost every crop being showered with man-made rain from sprinklers.

It has been our privilege to try to bring to our readers news and pictures of these developments. And we have enjoyed the challenge we set for ourselves to produce the most beautiful, most informative magazine in the farm field—one that progressive farmers deserve.

Which of the stories we have printed do

(*Continued on page* 95)

weather MEETS TWO MASTERS

Weather-safe feed is the best news yet for your herd. Haytime rains have met two masters—the ROTO-BALER and the Forage Harvester—engineered by Allis-Chalmers for *any* farm regardless of acreage. Now you can capture quality at its leafy best . . . two ways.

When blossoms say "Go!" . . . you're set to move fast with either machine. Teamed with the Power Rake and Allis-Chalmers Blower, they beat delays that can destroy the feed value of your crop.

Rain or drouth, you can breathe easy. You have hay safe in round bales with the built-in "umbrella" . . . and chopped forage preserved at its peak of nutrition.

Valuable feed often weathered and lost can pay for both outfits . . . why not *own* them? Your Allis-Chalmers dealer can show you their exclusive key features in action—just ask him!

FARM EQUIPMENT DIVISION—MILWAUKEE 1, WISCONSIN

ROTO-BALER makes the only round, buckle-proof bales with leaves sealed in . . . weather sealed out . . . a joy to handle and feed.

POWER RAKE has gear-shift control, 33 roller bearings. Two speeds forward, one reverse for tedding. The rake with *seven* outstanding performance features.

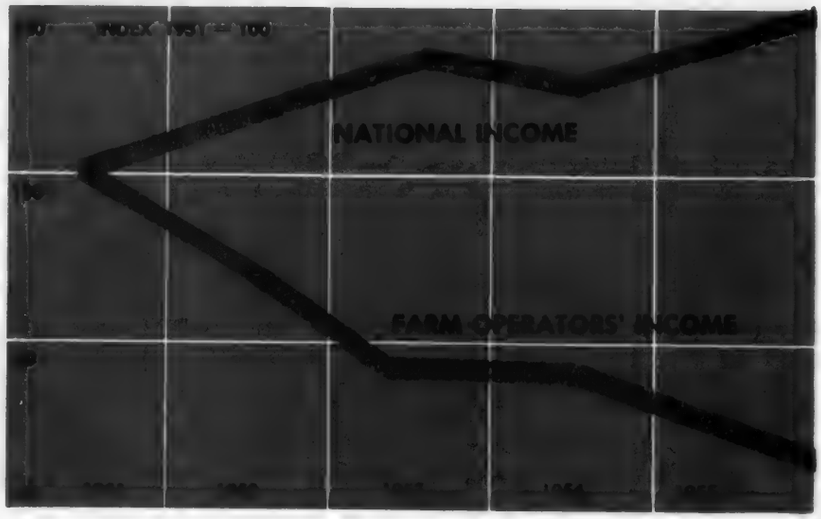
FORAGE HARVESTER'S *cut-and-throw* knives chop big tonnage with PTO. Knives are power-sharpened right in the machine with built-in sharpener.

Allis-Chalmers BLOWER *blows-and-throws* heavy volume through big 9-inch pipe. Big capacity for power unloading wagons. Fan blades are wide and cupped to handle silage and grain *fast.*

ROTO-BALER is an Allis-Chalmers trademark.

ALLIS-CHALMERS

The Case for the FARMER



ONE OF THE deepest mysteries of our government is why anyone would want to be Secretary of Agriculture, for the Secretary is called upon to answer an unanswerable question—the answer to superabundance. The Secretary is asked either (1) to find strong prices for products not in strong demand, or (2) to pay the grower the difference between a low price and the price the grower thinks he ought to have; or (3) to cut down production in order to raise farm prices. This boils down to a request that the Secretary cushion the laws of supply and demand to suit the farmer.

Why a Problem?

Overproduction is not the only reason farmers have price troubles. Were it so, there would be less reason for fair-minded people to want to help them. There are other causes, each unique, and none within the farmer's own control. These secondary contributors to the farmer's dilemma are: (1) The "cost-price-squeeze"—the rising costs of what the farmer buys and the lowering prices for what he sells. This squeeze is pinching him, top and bottom; it has a hand in all his pockets, and is the major cause of his unrest and confusion.

(2) The peculiar hazards of agricultural production—the weather, drouth, disease, insects—force the farmer always to shoot for a big crop. He can not set his sights on a production goal and have any assurance that he will hit the bullseye. He must shoot his whole wad, hoping his winnings will average out at about what he can sell profitably. The farmer believes that everybody should share the risk of this gamble—a gamble in which he may win in high production but lose in the marketplace.

(3) The farmer's products go to market seasonally as they are harvested. Even in scarcity there is usually a glut at the elevator when wheat is harvested. This results in seasonal price depressions. This, the farmer says, is an act of God, and the price penalty should be shared by all who eat food.

(4) The rising costs of processing food have increased the spread between what the farmer gets for his crops and what the consumer pays. The farmer has not shared equally in this spread by adding his own brand of markup because he can not (or will not) organize as labor and industry have organized. He has discovered no way to protect himself—he takes what he is offered and, pays what he is asked.

The farmer does not understand why the milkman should get more for placing a quart of milk on a doorstep than the farmer who produced the milk. The widening spread puts prices high enough so that the sales of some products which otherwise would move more freely, and thus relieve surpluses, are slowed down.

As Help Comes in the Door Freedom Goes Out the Window

How to give the farmer what he thinks he ought to have is basically the farm problem, that is, more income and/or profit, but how he wants this done is also important. A good farmer wants to stand on his own feet; he has a single-minded objective—to work his farm without interference and produce as much as good husbandry permits. He's willing to work and take his chances in the marketplace, but he wants his income to line up with income in other fields; he wants his income to go up proportionately with the cost of living. He doesn't want to be favored—he wants an even break.

He knows that for every dollar given him he must part with a dollar's worth of freedom; he doesn't want to wake up some morning and find that he's sold his soul down the river. Yet he knows, too, that his only recourse is government; he will be reluctant, but he'll agree to controls and restraints. He knows that light controls will favor the big efficient farmer; that heavy controls will keep the little, inefficient farmer in business a little longer.

The Case for the Farmer

The farmer and those who support him have a number of reasons why the farmer should expect these boons of more profits through government assistance. These reasons are: (1) Almost every industry is helped by the government. The tariff on bicycles pushes the price of English bikes higher than American-made machines; the airlines get subsidies to make up losses on "unprofitable routes"; the shipbuilders get a subsidy to make up the difference between Scandinavian and American wages. (2) After the war, industry was assisted tax-wise by the government to convert from tanks and guns to peace-time production. The farmer could not convert to screwdrivers; food and fiber are his only products. No one thought of giving him industry's deal of "costs plus 6 per cent" for placing marginal land in production, buying extra

(*Continued on page* 51)

No law can alter a sow's desires. Given reasonable care she will produce a surplus—like the nine (count 'em) pigs nestled near the dinner plates, on the opposite page.

The Stuff Farm Laws are Made of—

These are the basic ingredients for the 1956 Farm Law. None are new, but they are capable of infinite variations and combinations

Price Supports

Since the end of World War II, American farmers and farm policy makers have had a running battle over flexible versus rigid price supports. The issue itself seems simple enough, yet behind it is a complicated mass of recent history and economic philosophy.

Briefly, the issue is whether commodity prices should be supported at some fixed percentage of parity (90 per cent is the most commonly mentioned figure) or whether they should be allowed to fluctuate within a certain range, say 75 to 90 per cent of parity, in inverse ratio to supplies and estimated production. The advocates of flexible supports are divided into two camps: those who would allow the flexible provision to be exercised at the discretion of the Secretary of Agriculture; and those who would establish a sliding scale of support levels in relation to supplies and make it mandatory that supports conform to this scale.

By way of a refresher, parity is a ratio between an index of prices received by farmers for products sold and an index of prices paid for supplies they buy, with the period 1910-1914, a period generally accepted as one of agricultural normalcy, as the base. This is what is known as "old parity". Since this concept gave too little weight to modern technology, economists have come out with new parity, known generally as "modern parity". This raises the parity level for some commodities, livestock, for example, and lowers them for others, such as wheat. Until 1956 the old parity price was retained for some of the basic commodities—wheat, corn, cotton and peanuts—because it gave them higher parity prices than modern parity. The gradual application of the modern parity to these commodities began in Jan. '56.

The advocates of flexible supports contend that price supports should be used to provide a floor against sharp and disastrous drops in prices and, conforming to orthodox economic thinking, they rely on prices to direct production and avoid surpluses. Excessive supplies, they argue, should be allowed to express themselves in unattractive prices which will discourage the further production of unneeded commodities and encourage the production of items with a livelier demand.

This is a pretty theory, the champions of rigid supports admit, but, they say, it doesn't work in practice. When prices decline the farmer strives to grow more of a particular crop in an effort to maintain his income; the result is still lower prices. Price supports, in the opinion of the rigid proponents, should be used to keep agriculture on a par with the rest of the economy and to insure the farmer his fair share of the national income. They warn that agriculture is something of a public utility, that the farmer must not be punished because he does a top job of production. The answer to surpluses, they say is in better distribution (such as the recent "give away" to international welfare agencies) and increased consumption.

Official government policy has swung from flexible to rigid and back to flexible supports during the past 22 years as the national economy moved from depression to war and back to a truce. In the early New Deal days supports were on a sliding scale from 52 to 75 per cent of parity. When price ceilings of not less than 100 per cent of parity were imposed on farm commodities during the war, farmers were guaranteed 90 per cent of parity for the duration and two years thereafter. The Agricultural Act of 1948 called for a sliding scale of 60 to 90 per cent of parity, depending upon the size of supplies. An amendment the following year cut this range to 75 to 90 per cent. The Korean War caused a sharp rise in prices making it unnecessary to apply this sliding scale. At present, farm prices are generally supported at 82½ to 90 per cent of parity.

Production Payments

In 1949, the Secretary of Agriculture, Charles F. Brannan, proposed a farm price support program to Congress which included: (1) a new method of figuring parity; (2) the continued use of price support loans, purchase agreements, and direct purchases by the government; (3) an enlarged and somewhat different group of farm commodities to take the place of the six basic commodities which *must* be given support; and (4) an additional tool for maintaining the farmers' income—production payments for perishable commodities. To most people, this last item is *the* Brannan Plan.

Under a production payment plan, which, incidentally, has a history as old as efforts to support prices, the farmer would sell his product on the open market and, if the average price all farmers received for their product was less than the support price, he would receive the difference between the *average* price paid for that commodity on the open market and the support price. If the farmer, through luck or good management, received more than the average for his product, he would profit from his shrewdness; if he sold for less than the average, he would be penalized.

The plan would work this way: A farmer takes a load of sweet corn to market and sells it for 40 cents a dozen ears. He keeps a sales slip on this transaction. The support price on sweet corn is, let us say, 50 cents a dozen. At the end of the season, it is found that the average price received by farmers for sweet corn was 30 cents a dozen. The Department of Agriculture would then pay farmers 20 cents a dozen for the corn they sold. By hitting the market when it was high, the farmer in this example received 40 cents at the marketplace plus 20 cents from the government. In this way, he would have received 10 cents more than the average farmer—an incentive which would keep him trying for the high market.

It was Brannan's belief that this method of support would be useful for several reasons. It would permit the free market to operate and so give a realistic picture of supply and demand. It would tend to lower prices to the consumer since he would pay only the market price for the product and contribute to the support payment from his taxes, where, under purchase agreements and support loans, his taxes are used to keep up the price.

Brannan felt that this method of support would be most useful with such commodities as milk, poultry, eggs, meat, and other perishables. If supply got out of line with demand, he planned to apply production controls on the particular commodity just as he would under any other type of price support. Storable commodities, such as wheat, corn, cotton, etc., would be supported as now.

The plan came under attack for two reasons. Brannan set a limit on the amount of price support the government would give the farmer, that limit being 18,000 bushels of corn or its equivalent in any other product. In cold cash this would have amounted to around $25,000 at the time of his proposal. Certain farm elements felt that such a limit was unfair, and so they blasted the plan. The second attack came on the matter of cost to the government. Since no crystal ball would tell what the average price of any commodity would be, it was impossible to know in advance the amount of government price support needed.

Curiously, the plan was not attacked on the grounds that it would cause production controls to be applied to most farms.

Since the new administration took over, a system of production payments has been used for the support of wool. Before Brannan proposed the law, production payments had been our chosen method for supporting sugar. The production payment plan is far from a dead issue. There will be loud and persuasive voices speaking in its behalf this year.

Production Control

There are only two ways to prevent a surplus—cut down production, or increase demand, the latter a practical impossibility at this time. Some variation of production control has been the ingredient of every farm law since the government got into the farming business. Henry Wallace achieved notoriety by his version—plow down cotton, corn, and little pigs.

The Soil Bank plan, a form of production control, designed to do away with surpluses, takes out of production up to 40,000,000 acres which is said to be sufficient to cut down production from 3 to 5 per cent, our estimated present annual surplus. It will probably be voluntary on the part of the farmer, who will not receive supports or other benefits unless he complies. The farmer rents to the government a number of acres and receives a check, or CCC certificates redeemable in kind, based on the estimated value of the land or its normal production. The rented acres are improved by fertilization and planting to soil building crops. The government pays for this but some form of cross compliance will doubtless reduce 100% farmer cooperation.

Neither the President nor the numerous proponents of the Soil Bank believe it to be a panacea for the farmers' ills. The Farm Bureau, which, among others, is backing it, calls it a "step forward." It has its good points (there will be some reduction in surpluses and the farmer will have some cash in hand) but it also has its shortcomings. It is not an immediate relief and it falls short of being a practical help for the farmers' financial squeeze.

The government figures that it is better to store fertility, which in theory doesn't spoil, than to store grain which costs a lot of storage and spoils in the end. The fertility is for posterity, but the farmer gets his check now.

The Soil Bank is being received with mixed emotions by the farmer. He will accept it without enthusiasm. He sees little chance for an increase in his income this year. He doesn't believe it will help at all in stopping the widening spread between what he gets for his crops and what he pays for supplies. "How," he asks, "will taking my back forty out of production keep the prices I pay from going still higher?" The farmer asks, too, how his income will be increased by a payment which is designed to be no greater, and probably less, than the net value of the crop he doesn't produce on his back forty.

He knows, too, there will be a surplus under the Soil Bank, maybe not as big a surplus as in the past, but still a surplus, and when there's a surplus, prices can't get much better.

The Secretary of Agriculture, that iron man, and all of his administrative assistants will need all the fortitude they can muster when the Department starts administering the law.

Right now, farmers are using these long evenings figuring out how to beat the Soil Bank. Some of them will use their first check for more fertilizer to grow more corn and wheat. And most of them will be figuring out a way to rent Uncle Sam the poverty grass hillside instead of the good black land.

The certificates which the farmer will get, redeemable in cash or in kind for the crops he doesn't raise, have caused some head scratching. What, asks the farmer, is the advantage of having someone else raise feed grain when you could do it yourself at less cost? Someone, the taxpayer, without a doubt, must in the final analysis bear the cost of administration. Paper work doesn't come cheap in government offices.

The small farmer finds little solace in the Soil Bank plan. Already unable to make ends meet with the acres he has, he fails to see how his position will be strengthened by having those too few acres further depleted. His rental check can be no more than he earns now, which is already too little.

A modern version of the hot stove in the corner grocery is the peanut barrel in the machinery dealer's show room. Here an informal forum of corn farmers from around Kingston, Ohio, are trading spicy comments on the farm situation and figuring out ways to make a faster buck regardless of what Congress writes into the new law.

(*Continued from page* 49)

machinery, building up fertility. (3) "Everybody's getting fat but me," says the farmer. "And I'm skin and bones." This can't go on, for by some such analogy as one rotten apple spoileth the whole barrel or a chain is as strong as its weakest link, a weak member of the American economic family will contaminate all. (4) Agricultural fundamentalism, a classic academic term which has been with us for a long time under various names, is a traditional part of our thinking about the American way of life. Simply and briefly, agricultural fundamentalism is a belief that there is something intrinsically beneficial in living on a farm; that the farmer being close to the soil and nature, acquires certain sterling qualities denied the man in the factory and office. It is believed by many that large numbers of successful, well-knit family sized farms, with a settled, solid farm population, insure a nation of a democratic base. (5) Our laws, being recently benevolent to labor, permit the closed shop to flourish all over the land. Through the closed shop, labor can and does organize to strike down an entire plant or a whole industry to secure higher pay and shorter hours. This has benefited many. But the farmer asks, "What greater skill doth the milkman have?" The farmer asks for a portion of that same governmental benevolence. Industry gets it in high tariffs, in defense orders, in subsidies, in tax techniques such as carry-back losses; labor gets it whole hog through the closed shop; "I want mine," says the farmer.

The Plan of Attack

Those who will have a hand in designing a farm program—farmers and farm organizations, farm experts from the Bureau of Agricultural Economics, congressmen individually and their committees, and the big brass in the Department of Agriculture, all line up, in their approach to the solution, as economists, philosophers, or politicians.

Naturally, the economists seek a solution on economic grounds—a solution that will be sound economically, that will involve the least amount of money, that will cause no additional government borrowing. Their chief tool will be statistics and they will talk much of costs, production, the waste of small farm inefficiency. They will not object if the big farm eats the little farm, if the big people eat the little people. The economist believes the corporation farm or "food factory" is the "will of the dollar." He says: "succeed or quit."

The philosophers will say much of equality, justice and humanity. They will speak with feeling about the need for keeping the small farmer in business and will read dark meanings into the decreasing farm population and the vanishing of the small farm. All history will support their arguments, they say.

The politicians seek a compromise of the philosophical and economic approaches, drawing from each the sweetest. They ride two horses. There are more politicians in Congress than economists and philosophers, so the new 1956 Farm Law, like those that have preceded it, will have a strong political flavor.

Surpluses, History of and Cure for

Whatever the 1956 farm law may be, it can not possibly be more than a stop-gap measure. For there is no solution of a surplus that you can't sell, give, or throw away. There is no solution, that is, except to prevent the surplus.

There are three ways to deal with a surplus: (1) Give stuff away or sell it abroad. (2) Government control, farm by farm, to reduce surpluses. (3) Production control by farmers themselves.

In the whole long history of the world

(*Continued on page* 177)

C I P

C. I. P. means "Cleaned-In-Place." For the dairy farmer it promises to be as much of a convenience as R. F. D. With C. I. P. the milking machine and the pipeline leading to the milk cans or the bulk cooler can be cleaned without taking them apart.

There is not much argument about the fact that the old milk pail was the easiest thing in the dairy to keep clean. Anybody with a strong arm, some detergent, hot water, and a good pair of spectacles, could keep it in good condition. Then came milking machines. They required a quick rinse out before the milk dried, to keep out milkstone, and a washing in hot water and detergent, followed by a sanitizer rinse. Cleaning was built on a definite procedure and frequent inspection of teat cups, hoses and pails.

Then, about 3 or 4 years ago, the pipeline milker began to catch hold in dairy barns. The first thinking on the part of Board of Health inspectors was that pipeline milkers had to be taken down and cleaned out each time after a milking. The result was it took almost as much time to clean up all the lengths of pipe, rubber hose and valves as it did to do the milking. Farmers weren't interested in pipelines until C. I. P. came along. Even then, it took some convincing to prove to inspectors that a pipeline could be kept clean for a long while without ever taking it down and brushing it out.

Now, research, as well as several years' use under dairy farm conditions, has shown that a C. I. P. pipeline milker can produce the highest quality milk.

Bulk Milk Tanks and C. I. P.

When a dairyman puts in a bulk milk tank, the next thing that he usually wants is a milking parlor or pipeline milker in his stanchion barn with all their advantages, and that brings up the subject of pipelines. For a pipeline makes a milking *parlor* just that. Where dairy farms have changed over to these three modern methods of handling milk, they have found that they can cut their cost of labor as much as 50 per cent. Two years ago, it was the big dairy farm that was going into bulk tanks and milking parlors. Today, it is common for the 20-cow dairyman, because he has found that he no longer has to depend on outside help to take care of his chores. There is nothing more frustrating than getting all set for a milking operation and have one man appear late, morning after morning, or not appear at all. The milking parlor can eliminate this dependence of the small dairyman on the hired man. Looking at this modern equipment from the cow's side of the pipeline, it has its advantages, too, for she is not nervous because a substitute milker is on the job, fumbling around where she doesn't want to be fumbled with.

How's Your Hernia?

If you really enjoy carrying ten-gallon cans of milk through the door from the straining room to the milkhouse and then hoisting them up and dropping them down into the cooler, the pipeline milker won't be worth the money it costs; and it does cost sizeable money. But if you're past the age where you want to be a dairy athlete, the pipeline milker is about the most wonderful thing that ever was hauled into your barnyard in a half-ton pickup.

Dairymen have found that the first dividend they get from C. I. P. is that they are able to spend more time being a herdsman and less time being a scrubwoman. They can keep their eye on the cow's udder, the way she eats and the little points that pay off with the milk check. They have found that right in their own family it has made the difference between the boys liking dairying and farming or wanting to go to town. And they have discovered that the work is interesting and light enough that wives and daughters are glad to come out and help at milking time.

Not all the benefits from pipeline milk-

Cleaned-in-place pipe lines and milking machines have changed the clean-up picture from hand brushing, left, to a set-up in which rushing hot water does the work, right

ing are being chalked up by owners of expensive milking parlors. If you walk into the concrete-block milkhouse of Woody Conner, just outside Cambridge City, Indiana, any afternoon around 5:00 o'clock, you'll find Mrs. Conner getting the milking system sanitized and ready to do the job. Their barn is far from new and they use wooden stanchions in the milk room. Yet, it's a simple and practical setup.

The first thing Mrs. Conner does is set up the releaser mechanism on the pipeline milker so it discharges the chlorine solution in the wash sink and there the teat cups pick the solution up and send it traveling through the whole pipeline loop. The Conner's Chore-Boy pipeline milker uses only vacuum to operate C. I. P. washing; and a small fixture known as an air injector adds turbulence to the mixture of solution in the line to do a complete washing job.

Getting ready, feeding, milking, and clean-up now takes Woody Conner and his wife just an hour. His bacteria count has been brought down; now it is consistently under 5000. Says Mrs. Conner, "I never could carry those full milking machine pails in to be strained. Now with the pipeline milker, we get started together, then Woody can go off and do the bedding. It's no trouble at all for me to finish up the milking. The wash-up is really easier to do than washing the breakfast dishes, because the vacuum system does it all once you get the solutions mixed. The only trouble we've had with the pipeline was in real cold weather when some of the milking machine connections froze. All we had to do was flush hot water through the line, and everything thawed out."

Water Does the Work

Dr. H. E. Calbert of the Department of Dairy and Food Industries, University of Wisconsin, who has done extensive work with C. I. P. in the University's long-range program, says: "When you do C. I. P. cleaning of a pipeline milker, you are substituting rushing hot water, carrying detergents and sanitizers, for a brush and elbow grease. There are two basic kinds of C. I. P. One system uses the pressure type of liquid circulation supplied by a pump. The other uses the vacuum or gravity type of circulation supplied by the milking vacuum system. Both will do a good job of washing up if the right cleaning and sterilizing chemicals are used *and* if the dairyman finds out how to use them and then sticks to his instructions.

"We have pipelines in the milking parlor in our Research Building that have not been taken down for a year, and they are sparkling clean. With the hard water condition here in Wisconsin, we find that acid and alkaline cleaners used on alternate days do a good job of keeping down milkstone. Our cost of cleaning the 160-foot stainless steel milkline loop is about $1.65 a week. This includes water, water softener, sodium hypochlorite and cleaner."

Pressure or Vacuum

Either the pressure or vacuum type of C. I. P. makes use of a milk pipe that circulates the wash-up water completely in a loop around the milking room. A pressure system can handle pipelines of very long length. After milking, if the wash-up is done with a pressure system, lines are hooked up to a wash-up pump which may be the milk pump, or it may be a special pump used only for this purpose. The washing solutions are pumped out of the sink and through the lines; the speed of flow can be tremendous.

The vacuum type system is normally used on the shorter pipelines. C. I. P. will work on either the single line vacuum system or a loop. In a single line system, it makes use of an extra piece of equipment that is called a line washer and

(*Continued on page* 143)

DIMENSIONS
OF THE
GREAT ONONDAGA GIANT,
Now on Exhibition for ONE WEEK, at the
Bastable Arcade.

Length of Body,	10 feet 4 1-2 inches.
" of Head from Chin to top of Head,	21 "
" of Nose,	6 "
Across the Nostrils,	3 1-2 "
Width of Mouth,	5 "
Circumference of Neck,	37 "
Shoulders, from point to point,	3 feet, 1 1-2 "
Length of Right Arm,	4 feet, 9 1-2 "
Across the Wrist,	5 "
Across the Palm of Hand,	7 "
Length of Second Finger,	8 "
Around the Thighs,	6 feet, 3 1-2 "
Diameter of the Thigh,	13 "
Through the Calf of Leg,	9 1-2 "
Length of Foot,	21 "
Across the Ball of the Foot,	8 "
Weight,	2990 Pounds.

SYRACUSE, N. Y., NOV. 16, 1869.

There he lay, white and awful in the moonlight! Came he to his shallow grave by the hand of God or the hand of man? Gid Emmons and Hank Nichols dug him up one moonlit October night in 1869. He went on to become the most spectacular hoax ever perpetrated on the American public.

THE CARDIFF MONSTER

WILLIAM "STUB" NEWELL, who owned a poor little old farm at Cardiff, on Onondaga Creek not far from Syracuse, New York, decided he needed a new well on his place. One afternoon he went to see a couple of his neighbors, Gid Emmons and Hank Nichols, and asked them to help him dig it. Both of them allowed as how they were right busy getting in their corn, but they'd drop over after supper and help him get it started.

It was late when they got to Stub's place; but the moon was full and it was fine for digging on that brisk night in mid-October, 1869. The three of them piddled around a while with a peach wand, but none of them could witch, so Stub finally picked out a place down in the creek bottom and Gid and Hank started to dig. Stub went back to the house.

Gid and Hank couldn't figure why Stub wanted a well so far from the house and barn, but they were getting paid for working, not thinking. It was easy digging in the soft earth and in a short time they had a hole maybe three feet deep, when Gid's shovel brought up against something big and hard. He thought it was a boulder at first, but a good deal bigger boulder than you generally found around that part of New York. He and Hank finally dug most of the dirt off the top of whatever it was. Bent over and working in the shadow of the hole, it wasn't until Gid straightened up to get a kink out of his back that he got a good look at it.

His eyes snapped open wide and he shouted, "Jerusalem, Hank, it's a big Injun!"

There it lay in the moonlight, all pale and mysterious and awful. More than ten feet long, it was a lot more man than either Gid or Hank could comprehend. Its nose was at least a half foot long and its feet were as big as suitcases. It was naked and revealed all the intimate anatomy of a male and was sort of hunched up, like it had died from the bellyache. They started to holler for Stub to come down and see what they found. Stub said right away that it was a petrified giant, which was somewhat obvious.

By mid-morning of the next day, by that strange telepathic sense that so often confounds the scientists, the whole countryside knew about the discovery. By foot and by horse the citizenry converged on the Newell Farm to see the stone man. Seeing as how they were tromping up his clover field and keeping him from his work, Stub thought he ought to charge them a few cents to look at the man.

The amazing career of the Cardiff Giant was launched.

About the first question everybody asked was, "What is he and where did he come from?" Stub said he believed it was one of those giants that people talked about—big men that lived around those parts before the Indians came. A squaw from the nearby Onondaga reservation said her grandfather had told her of these giants and how the Indians had dug pits and covered them with branches to trap the giants. Once one had fallen in a pit, the Indians ganged up on him and done him in. Stub allowed this was one of those giants who had turned into stone right in the pit where he died.

Students and professors came over from

the colleges and sculptors and geologists and scholars from as far away as New York and Boston added their nickel's worth to the growing confusion. For some reason or other, the clergy got all hopped up and jumped into the brawl with both feet.

One preacher said the Giant was undoubtedly fashioned by the hand of God.

The experts split up roughly into three camps. There were those who held to the petrified man theory. Others claimed the Giant was a statue, fashioned by (1) early missionaries to impress the Indians, (2) prehistoric man to commemorate a God or a hero, and (3) the Phoenicians when they visited America long before Columbus. Still others, and a small minority it was, bluntly called the Giant a fake and a humbug.

The originator of the Phoenician theory, one of the most fantastic of all the screwball theories about the Giant, was Alexander McWhorter, from Harvard University. McWhorter looked the Giant over carefully with a magnifying glass and copied down some criss-cross scratches under the left arm. He took his sketches home and figured them out and said they were undoubtedly of Phoenician origin and translated roughly said, "Tamur, god of gods." This was a new twist for Stub, knowing what he knew, and he got down in the pit and tried to see what McWhorter said he saw.

A deputation of five very important men came in a body one afternoon to examine the Giant and determine once and for all just what he was and where he came from. These eminent men (among them Henry A. Ward, who had a museum in Rochester; Lewis Morgan, a fellow who knew more than anybody about New York Indians; the chancellor of the State University at Albany; and a couple of geologists). They went into the tent, which now covered the Giant and the pit, and after a long time they came out and stood around, scratching their heads and looking at something in the sky. Professor James Hall, the state geologist, sort of boiled down their opinions with an observation that sort of goes to pieces before you can get your teeth into it. "It is the most remarkable object yet brought to light in this country and although not dating back to the Stone Age, is deserving of the attention of archaeologists."

Only a few branded the Giant as a fraud. Among them was Andrew D. White, first president of Cornell University. There were a few canny newspapermen and a scientist or two who agreed with White that the most spectacular practical joke of all time was being pulled on the country. At that, White was almost taken in. He could not explain the channels in the back of the Giant, apparently worn in by running water over a long period of time. Neither could he explain the fossilized pores in the skin.

All this chin rubbing and double talk by scientists and famous scholars, and the columns and columns of newspaper talk on the Giant, only made him more important. As many as three thousand people viewed him in one day. Four-horse excursion stages from Syracuse did a booming business at one dollar a round trip. The "Giant Saloon" and the "Goliath House" quenched the thirst of the

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Which Bull Should I Use?

With artificial insemination the farmer has a wide selection of bulls, but only a few clues for choosing the right one

WITH THE USE of artificial insemination and frozen semen it is theoretically possible for a dairyman to breed his cows to practically any bull in the world. If he has kept records he knows something of the genetic background of every animal in his herd; and, of course, records are available on the bulls. Theoretically, he should be able to figure out a perfect mating that would guarantee a high producing calf. A pleasing theory, but in practice it can't be done. The reason—the inability of scientists to chart the endless combinations of breeding factors.

As one New York dairyman said, "Every time I decide which bull to use in a mating, I'm reminded of the character in 'Guys and Dolls,' who was forced to shoot crap with a Chicago gangster using dice with no spots on them. In the musical comedy they claimed that this was the oldest, continuous, permanent, floating crap game in New York, but us up-state dairymen make them look like pikers when it comes to gambling. Every time we breed a cow it's like throwing a dozen pairs of dice—all of them blank. And then, just to add a little suspense, we wait for four years to see if we've thrown a seven—or snake eyes."

This may sound like a most uninformed statement to those who have watched the geneticists inbreed and cross breed and come up with new hybrid corn and chickens and bees; or take a poor Spanish wheat that is resistant to Hessian fly and add just this resistance to a new high-producing variety; or shorten the tall sorghums and sunflowers to where they can be harvested with a combine. If scientists can bring two scrawny inbred lines of corn together to produce a hybrid which will mature in a given number of days, surely they can tell a farmer exactly which bull he should pick to cross with a particular cow to produce the best possible calf. But they can't.

Since the days when the Austrian monk, Gregor Mendel, worked in his garden with his wrinkled and smooth peas, geneticists have been able to predict some of the results of matings. They can say that if you take a black bull and breed him to red cows, all of the calves will be black and will also carry in their genetic make-up a factor for red. They can also say that if those black cross-breds are mated, they will produce calves that will fall into three groups with a ratio of one genetically pure red calf, two black calves which carry a red factor, and one genetically pure black calf.

The geneticist can easily go further and say exactly what the offspring of a Holstein crossed with a Red Poll will look like in the second generation. Here it will take 64 young to fully work out the ratio of those having black spots and horns, those having black spots and no horns, those which are solid black and hornless, those solid red and horned, and so on. They can go even further and say with mathematical precision the theoretical number of second generation animals it will take to fully express all of the possible combinations when 18 factors are involved —63,602,098,176.

The reason they can predict with certainty these results but can't give us much of a clue as to possible combinations for milk production is that in the examples we have mentioned the factors are all visible things like color, horns, and spots which can be seen and counted. They are qualitative things—either the cow has or doesn't have horns and each factor is governed by one or two pairs of genes—while milk production is a quantitative matter. All cows will produce some milk, but the number of genes which control the amount of milk she produces is unknown and may run anywhere from 36 to 100. Each pair of them influences the amount of milk she produces, but with our present knowledge there is no way of knowing which genes are working to build up the production of any given individual. And, just to make matters more complicated, the best guess is that the genes which favor high production are dominant—like the black gene in the black and red cross mentioned. Therefore, a cow which is a great producer might carry half her genes for low production, just as the black cow might carry genes for redness hidden in her genetic make-up. Mate this high producing cow with a bull of similar

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When the inseminator offers a choice of bulls, the dye in the semen identifies the breed; and the name printed on the ampule states which bull produced it; but we have no way of telling what chance arrangement of genes and chromosomes will be in the sperm which finally inseminates the egg to form a calf.

New Paints for Farm Jobs

Now that matching colors of implement enamel are available in spray cans it is easy to keep tools protected against the weather. Carrying a can in the tool box is one way to be sure paint is available when it is needed. Spray can painting costs more, but avoids the mess and excuses usually given for skipping small paint jobs.

PAINTS HAVE CHANGED. Not so long ago, a farmer used white lead on his house, any red paint on his barn, and whitewash, if anything, on the outhouse. Now dealers' shelves sag with cans of one-coat paints, anti-rust paints, paints that breathe, self-cleaning paints, latex, alkyd and zinc-dust paints. Chemists have come up with paints that look better, last longer, give greater protection and, best of all, require no special skill to apply. In taking the kinks out of their products, paint manufacturers leave one big problem to the purchaser: which paint for the job at hand.

Choosing a good paint for a wooden barn or home is simple enough. Quality house or barn paints, intended primarily for wood exteriors, are available everywhere. The use of a well-known brand from companies like Devoe, Foy, Lowe Brothers, Pittsburgh or Sherwin-Williams will eliminate the threat of poor paint. All such national firms stake their reputations on every quart of paint they sell.

Don't expect quality paint to offset poor workmanship. Repainting a building does not begin with the opening of a paint can. The first task is to prepare the surface. In doing that you'll get a fair idea of what caused the earlier paint to break down, which all paints do sooner or later. If the old paint is still in good condition but just needs refreshing, your job is easy. Dusting to a clean surface or washing with a detergent followed by rinsing is all the preparation needed. Symptoms of earlier misapplication of paint are readily recognized. Alligatoring (an alligator hide appearance) of an old paint film is usually caused by either finish coats being painted over undercoats that haven't dried or by adding excessive oil thinners to primers. Soapy-surfaced paint is caused by painting in cold, damp weather. Cracking of paint is mostly due to painting over unseasoned lumber which shrinks as it dries. Peeling and blistering results from the entrance of moisture behind the paint film. In every case, the remedy is similar. Find the spot where the moisture gets in. Painting should be done on a dry day, with the temperature between 50 and 85 degrees. The surface must be dry, smooth and free of grease and dust. Holes and nail-heads should be puttied, knots coated with shellac. Thick coats of old paint should be sanded down. Cracked or peeling paint has to be removed. A sanding disk on an electric drill or one of the new electric iron paint removers will do the job quickly and with none of the danger of a blow-torch. Paint which is chalking off should be wire-brushed clean.

If the old paint has blistered, carpentry is in order. A careful inspection will reveal moisture from some internal source. The dampness might not come from directly under the blistered paint. Moisture migrates. Siding in contact with the ground, stopped-up gutters which allow water to get under roofing, cracks around windows and leaking downspouts must be corrected. Ventilation has to be provided for tight buildings; vapor from closed livestock barns will soon push through paint if it has no other means of escape. Good ventilation is needed for the building as well as for the livestock.

Priming coats are unnecessary except where bare wood is exposed. For spot priming, a companion wood primer of the same brand as the house paint gives best results. Finishing coats should be applied just as they come from the can. Thinning out a paint to make it go farther defeats its protective purpose.

Quality dark-colored paints give good protection for 6 to 8 years but tend to fade, since they absorb the sun's rays. White and light-colored paints, while requiring repainting in 4 to 6 years, reflect the sun and offer insulating advantages. They usually wear to a better surface for

refinishing. Light paints which chalk freely should not be used above dark paints or the lower surface will soon discolor.

Painting Metal

In painting non-porous metals, adhesion can be a problem. House paints and exterior enamels give good service on metals from downspouts to haybalers, provided special metal primers are used. Such primers do several things: they stick to metal and in turn give adhesion to later coats of paint. They also inhibit rust in varying degree.

Standard metal primers like *Kromike, Lowe's Metalcote* or *Galvanized Primer* require finish coats over them, preferably of enamel, for greatest resistance to moisture penetration. The newer metal coatings, among them *Rustrem, Tame-Rust, Rust-Block,* and *Rustoleum,* may be used as primer, finish coat or both. While they give better service on bright metal, like the standard primers, the new products require only a minimum of surface preparation. The manufacturers claim that complete removal of rust is not necessary, though they recommend that loose rust be wiped or brushed off. Such rust-inhibitive paints come in a clear finish to be used where color is not wanted or where color is to be added in finishing coats of standard paints. They also come in a waterproof black which cannot be painted over. For matching the original paint on farm equipment, *Rustoleum* is available in 16 colors. *Rustrem,* also in colors, can now be bought in a heavy-bodied aluminium finish for roller application on wire fences where it is difficult to apply heavy coats of other paints.

Painting Masonry

Getting paint to stick on cement stave silos or cinder block milk houses, until recently, was almost impossible. Free alkali in cement and iron or sulphur in cinder block are rough on old style coatings. The method used to be to allow a year of curing, then to rinse with a neutralizer before applying house paint; this system required a good measure of optimism. Now there's no end to the new coating for masonry. Application is easy and lasting on new or old stone, stucco, cement, cement board and block, asbestos shingles and cinder block.

Unlike other paints, cement coatings are used primarily to aid sanitation and repel moisture rather than to protect from disintegration. For clear finishes, there are products with a silicone base, of which *Dam-Tite* is an example. It can be brushed or sprayed on to seal out moisture, to prevent frost damage and to stop chipping and efflorescent staining of any masonry surface. Cement-base paints, like *Bondex* provide both color and waterproofing. They can only be applied by brush and must be well incorporated into the pores of the masonry. Sold in powder form for mixing with water, they require a damp surface before application and they will not adhere to surfaces already coated with other kinds of paint.

WHAT TO DO WHEN A BARN

In the area above notice how the peeling is worse on some boards than it is on others. The paint is in good shape on the second board from the bottom. As you look closer you will be able to see that moisture is the cause of the trouble. Checks in the boards have let water get under the surface of the paint, and poor carpentry where the siding boards fit against the trim has allowed moisture to reach the paper and sheeting beneath. The first thing to do is to remove the loose paint with a scraper and wire brush.

When paint peels off of a farm building it can't always be blamed on the quality of the paint or the workmanship. These pictures show what happened to a barn just three years after a good quality paint was applied.

New synthetics are available for masonry coatings. Whether called alkyds, vinyls, latexes or whatever, the new paints are based on resinous compounds associated with the production of plastics. *Rub-R-Clad* by the Adelphi company, *Para-Stonetex* by Truscon, and *Glide-On* by the Glidden Company are typical. Some brands are of water-emulsion type and will stick to uncured cement. Some are useful on interior surfaces for they resist manure acids in milking parlors. Others, including those made by *DuPont,* adhere equally well to metal stanchions and brick walls. They stand up effectively against caustic rinses and steam vapors in milk houses. Most such paints contain no oil, so alkali from masonry won't soften them. Like latex paints for house interior walls, they can be quickly sprayed, rolled or brushed on new or old masonry, bare or previously painted surfaces. No primers are needed under them. One coat gives an extremely durable film, even if applied in damp weather. Drying is rapid. They wash down well and neither crack nor chip readily.

What Paint Is Made Of

Paint contains two basic components, a solid pigment and a liquid vehicle. The pigment gives hiding power and color; the vehicle, or binder, holds the pigment particles together. In whitewash, lime is the pigment, water the vehicle. White oil-base paints use lead, zinc or titanium or a combination of these as pigments; the vehicle is linseed, soybean or similar drying oils, so-called because they do not evaporate but dry to a hardened film. Drying oils also penetrate into porous surfaces, stopping suction and forming anchorage for later coats of paint.

Most paints have several more ingredients. Turpentine or other thinners are added for easy brushing. Compounds are included to hasten drying. Pigment extenders, like talc, minimize settling in the can. In cheap paints they can be mere adulterants. In quality brands, where they never exceed 10 per cent of the total pigment weight, extenders are used to aid durability and to control sheen and smoothness.

Varnish is not a paint, though many ready-mixed paints have some varnish in them. Varnish is clear, unpigmented, and includes natural resins, like pine sap, or synthetic resins of the plastics industries. The vehicle can be a drying oil, or in the case of the spirit varnishes, an evaporating liquid such as alcohol. *Enamels* are special kinds of paint, offering the color and hiding power of paints with the gloss and hardness of varnish.

Oil Paints

Almost half of the paint used today has an oil base, or vehicle. Throughout the life of the paint, a good oil stays sufficiently elastic to expand or contract with weather changes. While linseed oil, vastly improved over what it was years ago, is still preferred, soybean, tung, castor bean and

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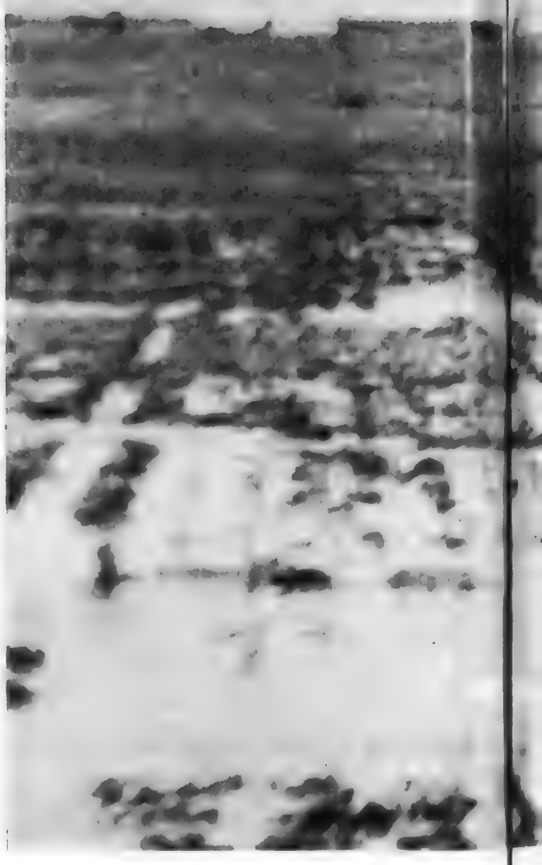
PEELS AND BLISTERS

After the loose paint is removed from the building surface a primer coat should be applied and worked into the cracks. A water repellent preservative such as "Woodlife" or "Penta W/R" can also be applied at this point. This will prevent further accumulation of moisture and provide an easily painted surface.

After the primer coat a calking gun should be used to fill in the holes left by bad joints between the trim and the siding. All checks in the boards should be filled. A day spent with a calking gun isn't as much fun as one spent with a 12 gauge shotgun, but it can be much more productive. A well-sealed building will hold paint for several years longer than one that is open to attack from moisture either from without or from within. After the calking sets for a day or two the second coat of paint can be applied.

This is the house that Vernam built on his homestead. At the right he is using surface irrigation in 1921.



"We bet the Government $16.25 against a quarter-section that we would stick it out for three years"

By Glenn R. Vernam

The

LIFE was very simple back in those dear, dead days, when going West was the answer to hope, ambition and golden dreams. We had no social security to worry about then; no quotas, no income tax, no communists to complicate our simple lives; no forms to fill out, no red tape to unsnarl, to take us away from our everyday affairs. All we had to do was take care of ourselves and one homestead —nothing much at all.

That was long before they thought of paying farmers not to farm. The politicians of that age had a method which beat any such crude modern scheme all hollow. They simply supplied all the extra farmers with homesteads. And to add a little sporting touch to the deal, they bet the homesteader this 160 acres of land against $16.25 that he would starve out within three years.

It worked pretty good, at that. As a means of keeping the citizenry from squandering its time and substance on politics, national finances and the lack of indoor plumbing in Patagonia, it was a masterful coup. And as a plan for limiting production, it made Mr. Benson's and Mr. Brannan's programs look like conflicting theories of relativity. And it was as simple as the bellyache. I'll never forget the overproduction we never had to contend with on our particular stretch of Wyoming sagebrush thirty-odd years ago.

Not that we didn't work hard enough. We did. Sixteen to eighteen hours is a day's work anywhere. That first crop had to be planted in time to mature before the high country's early frost. And before the crop could be planted, the ground must be put in shape for irrigation. Without water, we could not grow anything. We had no money to hire help nor any social planners to tell us when we had put in enough hours for a well-rounded life. All we could do was to go out and start throwing the dirt. Both of us. That was me and Irish—Irish is my wife.

Irish, Lettuce and Rabbits

Irish only weighed 110 and had never done any outside work, but she had ambition. She made a top hand from the start. Her busy fingers were in everything from tar-papering the shack to clearing sagebrush and skinning the plow team when I broke out irrigation ditches. The housework? Oh, she managed that, too. Don't ask me how a woman accomplishes her ends. Anyway, a one-room board shack is not much to care for, especially, when its occupants only stop there long enough to eat and sleep. And cleaning was simple. A door in each side, plus a Wyoming wind, assures the removal of anything not tied down. There was always a wind. Yes, there was some dust with it, but that got renewed every day. And the baby, being only three months old, couldn't walk out on us just because she was somewhat neglected.

I think there should be a monument to homesteaders' wives set atop the Rocky Mountains. Something like the Christ of the Andes, only on a grander and more imposing scale. Irish was the best 110 pounds of woman who ever wore a pair of Levis.

Even with both of us on the job every waking hour, it was slow going. We had trundled our wagon load of household goods and two jags of new lumber onto the place in March. First, we had to get our car-roofed shack up. Also, a small barn and a barb-wire corral. That took time. More time was consumed in getting our ditches surveyed so the fields could be laid out to proper advantage.

By the time we actually got started making a sagebrush flat into a farm, we began to see the theory behind that old saw about Rome not being built in a day. The brush had to be chopped out with a grubbing hoe, piled and burnt; then the ground plowed and leveled, with all high spots removed and depressions filled to

Homesteaders

allow the water a free flow. About that time, the water would find a soft spot in a new ditch-bank, presenting us with a few new gullies to laboriously fill and smooth up. We found we could put in a lot of mileage on a small spot.

Along with this, horse feed was scarce and money was scarcer. That meant turning the stock out on the range and working them alternate days. It wasn't a method calculated to do the horses any particular good, but it did enable us to eventually get part of our most promising acres cleared, plowed, leveled, seeded and ditched for irrigation.

And the horses really couldn't accuse us of selfishness. We went through on grass, too. Well, they call it lettuce, which is practically the same thing. The alkali, bugs and sundry other blights captured most of our garden that first summer. The lettuce, alone, made a crop. I have never cared much since for lettuce. Neither crisp lettuce nor fried lettuce; I don't even like lettuce in my sandwiches. I'd be just as happy if they never grew another leaf of lettuce—anywhere in the world.

The rabbits helped some, though. There were plenty of rabbits. They served to relieve the tedium of straight lettuce. Then, the following winter, when we changed our diet from lettuce to potatoes, we had rabbits and potatoes. We used them together and separately, stewed, boiled, fried, broiled, baked, roasted, fricasseed, barbecued, and in hash. I also lost considerable zest for the flavor of rabbit meat that winter, especially rabbit when accompanied solely by potatoes.

Still, the rabbits were perhaps a good thing. Without them, we might have started in on the prairie dogs and rattlesnakes. One never knows. There were plenty of both. When we started spreading water, the dogs began moving in all directions; I ran enough water down dog holes that summer to float a battleship.

The snakes hit for the dry spots. It was rather dry around the house. The ones that located this haven rattled their pleasure and sent back for their relatives. We found them in the barn, under the doorstep and in between. Why we didn't get bit still puzzles us. A sudden dry, high-pitched buzz can even now prove my claim to all-time jumping records; I learned to jump forwards, backwards and sidewise, all with equal ease, and flatfooted.

Altogether, it was a pretty strenuous summer. Still, we weren't worrying. We had our eyes plastered on that delectable future promised all those with stamina and courage. Our visions embraced waving fields of green alfalfa, quantities of sleek white-faced cattle scattered over nearby hills, a big rambling house sprawled under some future cottonwoods and fully equipped with all modern comforts and accessories.

A Tree is a Tree

We drove a team and wagon twenty miles to the river, one Sunday, to get our start in cottonwoods. The load of sprouts we brought home and planted would have sheltered a lot of house if the alkali hadn't burnt up all but three of them. I guess the Lord figured those three would be enough to shelter all the house we'd have for some time. If that's the way He figured, He was right.

The alfalfa did better. There must have been at least half of it that pulled through. The Russian thistles, which filled in the bare spots, made it look like quite a pile of hay when we got it stacked up alongside the corral. The fine white-faced cattle that ate our grain, unfortunately, belonged to someone else. It was all open range around us. We had neither time nor money to fence until midsummer. By that time, we didn't need a fence. Irish got to be quite a cow-puncher, chasing those cows back to the great open spaces. I think that must have been where she learned to swear.

**"There were plenty of rabbits. We used them—
stewed, boiled, fried, baked, roasted, fricasseed, barbecued,
and in hash. We lost considerable zest for rabbit meat."**

**"The new acreage we had laid out shrunk a half by seeding time.
And the crop we got from that didn't burst any barn seams.
We did have enough to winter our stock, though, by counting
forkfuls and sorting the manure carefully."**

On those forays Irish rode a locoed mare, appropriately named Blaze. She was a splendid saddler and a wonderful cow-horse. Unfortunately, she had been poisoned by loco weed previous to our association with her. The disease hadn't affected her physically, but had left her a trifle eccentric in behavior. She hated to work in harness, showing her displeasure by balking, running away, and chewing on her teammate. She absolutely refused to be led by the halter and frankly hated automobiles. When an occasional car would pass her along the narrow prairie road, she would immediately lay back her ears, bare her teeth and race after it at a dead run, as though determined to destroy any such stinking threat to good, honest horseflesh. When ridden to town, she would invariably put on a show upon being re-mounted. Immediately upon being untied from the hitch-rack, she would start tossing her head, rearing and side-stepping in a circle like a green bronc about to come unhinged. The rider had to mount on the fly. And the moment he hit the saddle she would leap the length of herself and tear off in all directions as though escaping from the environs of hell. I think Irish always got as much fun out of it as the mare did, judging from the way she usually chose the mare to ride when going to town.

Blaze was with us through our entire seven years on the homestead. During the period of the full moon she was always more unconventional than at other times. But always in the work she liked, handling stock or jogging the trails, she never shirked or let us down. We thought lots of her. We have often hoped she lived out her alloted time with the neighboring rancher who bought her when we moved away.

Winter Pastimes

One nice thing, it was a light job to get the year's harvest under cover before winter. The potatoes were small enough to handle easily and the rabbits furnished their own accommodations. Wood was free for the getting. I only had to haul it fifteen miles from the mountain. Our water supply, after the canal was shut off for the season, was a mile-distant lake. Just a refreshing drive with a couple of barrels in the wagon each morning. It helped keep a person from getting morbid and feeling sorry for himself. We sure had no pie-in-the-sky fireworks that first winter.

The first cold snap let us in on a big joke the sun had been preparing for us during the summer. Helped by the hot, dry winds, it had opened up every crack in the shanty. We covered up all we could find, but we missed a lot. Quite a lot, in fact. An average Wyoming blizzard will disclose holes that no human eye can detect. We stuffed rags in the cracks till the walls looked like a mattress the moths had been working on. The wind would eventually work them out again, but that was all a part of the game; it kept us shut-ins busy.

We had another game we played a lot that winter. During the big blizzards the wind would drive snow through the key-hole in the door to form a long, thin drift out across the floor. We bet on the length of the drift in the morning. The loser had to build the fire. We never bet on the drifts that fell across our bed, though. That was too sort of intimate to be good sport.

We invented a number of similar entertainments to amuse ourselves; we bet on the depth of ice in the water pail to see whether I hauled water or Irish melted snow in the washtub; we devised new ways to cook rabbits and potatoes; and we figured plans for a windproof house. We were mostly our own company. We had only one reasonably close neighbor. And town—

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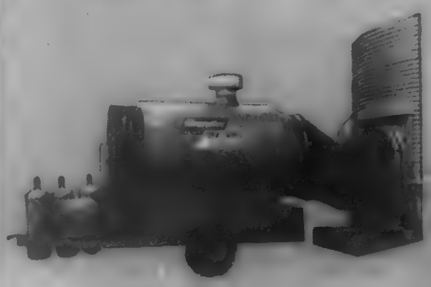
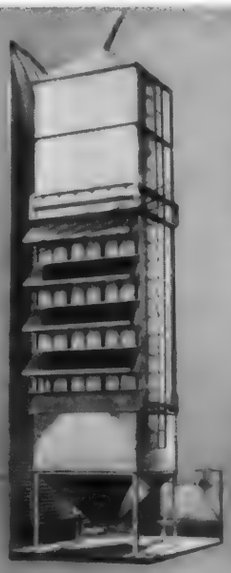
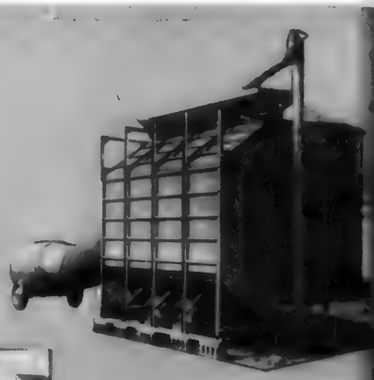
"Those neighbors of ours! In case of trouble or need
they gathered from all directions, on horseback or in wagons.
Distance was no object, nor was weather."

Trailer-type Farmotive drier (below) burns bottled gas, can be quickly set up to force heated air through grain in storage. Tower drier by Finco (right) is in three sections; top garner bin holds 155 bushels; center section dries 120 bushels at a time, with a 100-bushel holding bin in the base section.





In the 170 bushel Cropgard wagon drier (below) heated air is blown under a false floor in the wagon bed; load empties by hydraulic lift. A two-unit design built by Hartzell (right) has a portable heater separate from the 300-bushel bin for batch drying. The Behlen machine (opposite page) is a mobile package, with heater, drying bin and elevators in a single unit for fast grain conditioning.



Grain Driers

by Chester Charles

FARM SIZE grain driers are no longer a novelty. Grain drying, until recently an emergency measure in wet seasons, is rapidly becoming standard practice among the more efficient grain producers and is giving them a tighter control on both harvesting and marketing.

Grain drier design is keeping pace with the improvements in other speeded-up phases of mechanized agriculture. "The last day of harvest doesn't mean that pay day has arrived," says Galen Petry of Kings, Illinois. "Fast plowing, high-powered cultivation and quick combining or picking don't mean much if slow rot hits the grain bin. My big question used to be: *Will my grain keep?* Why plant a crop, nurse it, harvest it and then let a few per cent of moisture prevent a farmer from ever cashing in on it? Not me! Now I can sleep nights. When the grain's put through the drier and in the bin, the money's in the sock."

Farmers like Petry are purchasing grain driers with a two-edged purpose in mind: to take excess moisture out of grains and to take some of the gamble out of farming along with the moisture. Equipment investment is offset by these advantages:

Earlier harvest: Crops can be harvested one to three weeks earlier, at the peak of their yield and nutrient value. Shattering losses are reduced. Insect, weather damage, and weed infestation are reduced. Fields can be reworked earlier for crops to follow, or in the case of corn, stalks can be pastured while still reasonably succulent.

Better operation: Equipment works more efficiently on standing stalks or unlodged small grain. Pickers husk corn cleaner at early harvest, combines shell out small grain better, improving quality and increasing yields.

More acres, more bushels: The day is stretched an hour at each end for combines. Field shelling of corn cuts homeward loads in half, leaves wet cobs in the field for quick disintegration, permits use of lighter elevators.

Later hybrids: Farmers in areas where 90-day corn was the rule are taking a chance on 115-day hybrids, with yield increases up to 20 bushels per acre.

Spoilage avoided: Helps grain meet new government sanitary standards. Allows storage in tight bins, free of weather, mold, rodent and insect hazards, awaiting on-the-farm use, more favorable markets or government purchase. With corn, shelling means easier handling, cuts storage requirements in half.

Immediate feeding: No longer any risk of new grain disturbances to livestock.

Higher prices: Eliminates dockage for moisture. Sometimes brings "old grain" prices before heavy harvest begins, though this advantage will pass as drying increases. The farmer takes the profit for drying.

"Higher prices is right," says Galen Petry. "With new corn going for 90 cents last fall, who wouldn't be tempted by a $1.60 support price?

"And drying not only avoids spoilage, it practically eliminates it. On a below-zero day, with a good tail wind behind the drier, you can dry corn fast and cheap and upgrade it, too. Last year my neighbor picked some 25 per cent corn and stored it. It went up to 29 per cent in the storage bins. Smelled like silage. We put it through my drier and it sold as No. 1 corn. Believe me, drying takes more than water out of corn. Drying gives it a polish that can fool the smartest of the corn jockeys, the floating dealers. When my neighbor's corn was being dried, you could smell the mold going out of it in the steam."

Every Purse, Every Preference

Running a drier is easy. Picking one out can throw you. Styles and shapes are myriad, but in every drying set-up, forced air is the drying medium. Systems of handling the grain, and kinds of equipment used, dovetail together in zigzag fashion. These are the zigs:

1. Bulk system. Large quantities of grain, often the entire harvest, are dried as a unit in the place of storage, whether crib, bin or granary.

2. Batch system. Smaller amounts, such as one day's harvest, are dried in a structure designed for that purpose, and are subsequently moved to storage elsewhere.

Regardless of the system used, the structure holding the grain must be provided with perforated ducts, slatted floors or other passages for air to enter and escape through the grain.

The zags take bifocals to follow. Most available equipment can be used with either of the above systems. The simplicity (and cost) of equipment increases in this order:

1. Blower fans, the heart of all driers, come frame-mounted, for permanent installation in bulk storage or batch structures. Others have wheels for temporary setting up outside of grain structures. All such fans, blowing natural air, may be connected by a system of ducts to multiple bin arrangements.

2. Heated air devices are really out-

On-the-farm drying hastens harvest, saves grain, helps prices

door furnaces, similar in type and size to household forced-air furnaces. They burn oil or gas. Some are stationary and, as a safety precaution, may be housed under a roof adjoining the drying structure, like home furnaces in utility rooms. Others are on wheels for temporary duct connection to bulk or batch systems. All types have fans built in them. In some types of portable heaters, the fans are small so that the burners may be used for miscellaneous heating in cases where little air pressure is needed, as in warming workshops. For grain drying, a small-fan burner or heater is set up in front of a separately installed natural air fan, in which event the latter becomes a booster fan to increase the air flow.

To complicate the choice, the engineers have thrown in wagon drying for small batches. Air is forced through a false floor on which the grain rests in the wagon or truck. Heat must be used, provided by a portable or stationary heater, connected by canvas-duct to one or more wagons. Specially designed wagons with built-in, oil-fired heaters and with power take-off fans, are now available.

All equipment may be used to dry hay as well as grain. For the farmer who is uninterested in flexibility, but wants the ultimate in grain driers, there's the deluxe choice, which fits into a separate category:

3. Column driers look like big sheet-metal boxes. They are complete packages, designed by the manufacturers to eliminate the need of giving away $200 worth of engineering advice with every $400 fan. Here is heated-air, batch drying by the stopwatch, with no duct connections to make, no extra drying structures needed, and little or no setting up required. Heater and fan are an integral part of the bin. Loading and unloading are mechanical.

These machines are called column driers because the grain is placed around a central air duct within the bin. In some models, the grain column is upright, in others horizontal. To provide a variety of choices, manufacturers produce column driers in stationary, skid-mounted, or wheeled styles. Because of bulk and handling difficulties, their use as forage driers is not practical. Grains, cranberries, ground cobs and a miscellany of other products go in damp and come out dried with no handling and a minimum of attention.

Old Tune, New Player

The conventional method of taking mois-

(*Continued on page* 150)

A PAGE FROM THE 1955 CORN DRYING RECORD OF RICHARD WARD, CRAWFORDSVILLE, INDIANA

Equipment: 300 bushel batch bin. Power: 7½ horsepower electric motor. Fan: 36 inch. Heater: Oilburning Type. Fuel Consumption: 8 gallons per hour.

Date	Moist. Start	Moist. Ending	Electricity used K. W. Hrs.	Time Start	Time (Heat) Ending	Total Heating Time	Cooling Time	Fuel used (gal.)
Oct. 18	21.8%	13%	59	4:40 pm	10:10 pm	5½ hrs.	50 min.	45
Oct. 19	21%	13.2%	39	10:00 am	3:30 pm	5½ hrs.	45 min.	45
Oct. 19	21.5%	14.1%	44	6:00 pm	11:15 pm	5¼ hrs.	35 min.	45
Oct. 20	21%	13.05%	47	8:30 am	2:00 pm	5½ hrs.	50 min.	50
Oct. 20	20.5%	13.1%	58	3:45 pm	9:15 pm	5½ hrs.	50 min.	45
Oct. 21	20.5%	12.8%	37	7:00 am	12:30 pm	5½ hrs.	45 min.	45
Oct. 21	19.5%	12.5%	54	2:00 pm	7:30 pm	5½ hrs.	45 min.	45

Recap: 320 gal. fuel oil @ 14.9c per gal. $47.68
338 kwh electricity @ 2c. 6.76

Total $54.44
Cost per bushel for 2100 bushels (no depreciation included) . . . 2.59c

Selling for the TOP Dollar

By Charles R. Koch

IT WAS EARLY afternoon of one of those hot, humid days of mid-August. As Bob Hiatt and the commissionman walked throught the feedlot, the steers roused from their nap and retired to a neutral corner to gaze at the intruders. The commissionman turned to Hiatt, "These bullocks are ready to go, Bob. They're just the kind of cattle that are selling now, Choice grade and right weight; ought to bring a good twenty-four cents."

But 24 cents didn't look tempting to Hiatt right then. He felt the market wasn't right. Most of his fellow feeders were feeling the same way and they decided they would do better if they held a little longer. So they held; and the holding developed into an endurance contest; and finally by the middle of November they found themselves selling heavy, over-fed cattle at prices 25 per cent lower than they were bid months earlier. All of which only goes to prove the wisdom of the old cattleman's axiom, "The first thing a feeder needs to learn is when to give his cattle a good selling." The question is: When should he? We'll try to explore some of the answers.

To start off, Rex Beresford, out at Ames, Iowa, who has spent many long years advising beef growers on their production and marketing problems, says that one of the big blind spots in the feeder's makeup is his lack of an adequate knowledge of grades and finish. Couldn't we just publish a set of pictures of the seven grades of slaughter steers and heifers from Canner through Prime and run a detailed description of each of them? Then anyone, after a little study, should be able to go out and grade a bunch of cattle. Trouble is, it just isn't that simple. Cattle grading is a bit of a science and like any science it can only be mastered in the laboratory. The place to learn grading is at a terminal stock yard. Here is a cattleman's college and all the courses are free.

What can a man learn at the yards? Take this matter of grade and finish. The most popular grade at the present time is Choice. The typical description of a Choice steer as expressed in animal husbandry and judging classes goes something like this: "He has a blocky, thick conformation with plenty of natural fleshing and a moderate covering of fat; he is deep in the flanks and has a straight underline, has short legs, deep moderately thick quarters, a full level rump, a broad, level top line." These terms can and do mean many different things to different people. Actually, they say little more than the brief but enthusiastic description of his finished cattle voiced by Frank Ludwig, a Remsen, Iowa, producer of Prime beef. Says he: "They're beautiful!"

But let a man walk from pen to pen in a big, well-filled yard, up and down alleys and along catwalks gazing down on the backs of thousands of cattle of every grade and degree of finish, rubbing elbows with commissionmen and packer buyers who are in constant contact with the market, and in the course of a single morning he will learn more about grades, finish, the most popular weights and marketing trends than he would grasp from books in months.

In the Yards

For example, walk down the alleys of the Sioux City Stock Yard with a veteran commissionman like Tom Fife, manager of the Sioux City Producers Commission Association. Almost immediately you see that the only grades with which a feeder need concern himself are the four upper ones, Commercial, Good, Choice and Prime. The other three consist of cattle which have had little or no time in the feedlot or are of such an unthrifty character they could be fed from now till doomsday without taking on an extra pound. Then, despite the fact that the official government descriptions of all the various grades with the exception of Canner and Prime are prefaced by a warning that "cattle possessing minimum qualifications for (this) grade may differ considerably in appearance," it won't take many hours around the pens before the farmer-student can sort out Commercial, Good, Choice and Prime cattle with few misses. He will learn the roles that weight, finish and yield play in the pricing process and go home with a head full of the kind of marketing knowledge that will enable him to do a much better job of directing his feed program and selling his finished product. A farmer-feeder should treat himself to this tour once a year—walk through the yards with an old-timer and let him tick off the grades—then do it himself.

He'll pick up some other valuable ideas too. Like Fife's advice

"I'd feed those cattle another thirty days," commissionman Bob Cross advises a farmer client. The advice of a man in daily contact with the market is invaluable in doing a good job of selling. The cow herd (opposite page) is the beginning of the long process of growing and feeding that can be wrecked by poor marketing.

that the time to think about marketing cattle is when they are bought. Fife has definite times for buying and selling.

"Buy gambling cattle, yearling heifers or two year old steers, in early August," he says. "Full feed them during the fall and have them ready to market from mid-December to mid-June.

"In October and November buy plain cattle to use your roughage and some corn and have these ready to market in May on the normal price spread. About this same time or a little later pick up some heifer calves or yearling steers for the summer market and buy steer calves of better quality to be fed on grass and marketed the following fall. Medium to just good steer calves are usually good property if they can be bought cheap enough and the farmer has enough pasture and roughage so he can graze them through the summer and fall and head for the spring market.

"Your buying should start in early August," Fife continues, "and end by the turn of the year, or at least mid-January. It is usually a bad policy to try to buy in the spring and sell in the fall. On such a deal you most often have to carry the cattle two years to make any money."

Fife has been urging this program for years and many of the big feeders around the Sioux City market, men who feed anywhere from 500 to 5000 head of cattle a year, have been following it with consistent success. Charles Beermann, Dakota City, Nebraska, Angus breeder and feeder, is one of these. While he endorses the Fife system in toto, he emphasizes another important point. "When you once adopt a program stick to it. Don't try to hang on when your cattle are finished and prices are down. Nine times out of ten you'll run into greater losses."

The finish of a bunch of cattle, Beermann will point out, can be determined by the amount of fat covering over the loin, shoulders, rump and other parts of the body, a matter of judgment that comes from sharpening the eye on lot after lot of cattle and from regular rounds in the terminal yards in the tow of a buyer. "When a steer's back will hold water," he says, "he's ready to go to market."

Another point which should always guide the feeder in his plans is the pattern of geographical preference in the matter of

Photographs by
Robert B. Goodman

Cigar-smoking Sam Siegel, buyer for the Siegel-Weller Packing Company, makes his morning rounds at the Chicago Stock Yards; he is followed by commissionman Lester Hatch and buyer James Corkery, in the Commissar cap. The farmers in their wake will receive a liberal education in cattle marketing before the noon whistles blow. A call to his commissionman (below) is the feeder's most reliable source of market information. When a steer can hold water on his back (above) he is carrying a Prime finish.

weights and grades. As was already noted, Choice is now the most popular grade in most parts of the country. It is the almost unanimous preference of the chain store trade; the housewife finds it just as tender and less wasteful than the Prime grade. In weight, the 500 to 700 pound dressed steer carcass and the 500 to 600 pound heifer carcass are always in demand. Translated into beef on the hoof, this means that the good yielding animal of 800 to 1000 pounds is always marketable.

Geographical Preference

Definite variations on this pattern occur throughout the country, though. A man most sensitive to them is R. W. Shay, who heads up the beef carcass sales division at

(*Continued on page* 128)

FISH *and* RICE

By Wellington Brink

Increased rice yields and an income from fish in the off year have sold the new fish-rice rotation to Southern farmers

You might know somebody would think of it sooner or later. We've had livestock in our rotations ever since man quit hunting and started to scratch the earth for a crop. Now we have fish for the first time replacing livestock. This is an old story in Europe and in the Orient, but it's new here where fish and rice are being combined in Arkansas in a new and unique rotation.

Down here rice farmers usually fallow their rice fields. During the off years the fields produce no income. Now the smart operators are keeping their fallow fields under water and making a good cash income from a fish crop. In addition to a cash income, the soil is improved through conditioning and enrichment, weeds are controlled, and water is used to better advantage.

What kind of fish? Goldfish, and the rough species of food fish, and game fish all have a part in the fish-rice rotation. Take goldfish, for example. Roy Prewitt has 283 acres in this unusual crop near Lonoke, Ark. He sells 8 million a year to the ornamental trade, aquariums, dime stores, bait shops. He ships by bus, train and plane. And because he is clever and resourceful, he gets them to his customers in A-1 condition. His trade secrets include an ingenious type of shipping can, plastic bags for retailing—one, two or three at a time to youngsters—and a chemical which serves to hold down the mortality rate. He even injects hormones to induce spawning in off-seasons, and then catches the eggs on Spanish moss. He treats his goldfish for parasites and disease, grades them carefully for the market, practices selective breeding, and controls the temperature-metabolism relationship.

Ewell Nixon, on the other hand, specializes in minnows. He is one of Prewitt's neighbors. The minnows go to wholesalers at 2 cents apiece, in lots of as many as 100,000 at a time. Buyers pick them up at the farm with tank trucks. And what happens to all these little fish? They are used by fishermen, it is alleged, to catch big fish.

Nixon also grows carp, buffalo, goldfish and game fish. Selected goldfish stock sells to pet shops for as high as $75 per thousand. He can produce a fighting 4-pound bass in a single year! He has run up a yield of 30 tons of good sized game fish on as few as 50 hard-fished acres. The rough fish are usually seined, but a few are trapped. They find a ready market in the South, dressed, filleted and frozen. The game fish are harvested mostly by sport fishermen at the end of a rod. Clarence Lilly and his four sons, in this same area, have 1,000 acres out of a total of 1,759 under water. Lilly didn't start out to raise fish. The fish came in normal course, without stocking, and soon became an intrinsic part of his operations. He values his fish largely for the good they do his soil and for the way they fit into his water-management scheme. If he didn't get a nickel from his fish directly, he'd still keep right on growing them. In fact, Lilly and his sons are seriously considering setting up a processing plant for transforming the fish harvest into fertilizer. Not long ago, before draining one of his ponds, this farmer invited the neighboring public out for some free sport. More than a hundred townsfolk responded, and their catches sparkled with 4- and 5-pound bass and with fat and fighting crappie and bream.

Five miles west of Lonoke is the 385-acre farm of Glynn C. Bailey. Some 260 acres are in his prevailing fish-rice rotation. The largest fish he has harvested, a buffalo, tipped the scales at 26 pounds; but the average, attained in 2 years, is 10 to 12 pounds. There are golwhollickers still waiting in his ponds—some of the catfish as heavy as 40 pounds. Two boys wore themselves out trying to carry a four-footer over one of his levees. And when he drained one of his ponds for a television audience some time ago, a mass of big buffaloes—fish—knocked down one of his workers with their frantic flopping and bystanders actually had to rescue the guy from his predicament.

Lilly, like his fellow fish farmers, is a water wizard. Acutely conscious of a lowering water table, he husbands every drop. In 1906 he dug down 35 feet for water that he now finds at 71 feet. Today, he relies mostly on reservoirs and natural-drainage lakes. Water, he notes, never wears out. He uses it over and over again, for as long as he can hold it on the land. There is no problem here such as farmers have in some parts of the Southwest—a

An acre of water will produce as much meat as an acre of grass. The crop is harvested by seine, trap, or bamboo pole. When rice goes in the weeds are gone, the soil is conditioned, and fertility is up.

saturation with unwanted minerals. Lilly and other Lonoke farmers have the advantage of a rich soil that is underlain 2 to 4 feet down by a nearly impervious clay subsoil.

These four farmers — Prewitt, Nixon, Lilly, and Bailey are leaders in the Arkansas Fish Farmers Association which has representation from 15 counties in central Arkansas. Each is an active cooperator in the Lonoke-Pulaski Soil Conservation District. Each is a soil and water conservationist who grows fish as a rotation crop with rice. They are the advance scouts of a modern version of an agriculture long practiced to some degree in parts of the Orient and Europe.

How it is Done

The usual method of working fish into a rotation is to flood fields which have had two years of rice. Water comes from the usual sources, streams, storage ponds, wells, and occasionally a lake. A depth of about 4 feet at the deepest part seems to work best. Flooding is done immediately after the rice crop is off, usually from September to November. Stocking is done as soon as the flooding is completed. If game fish are wanted, stock comes from the Federal or State governments, or from a pond previously stocked. Goldfish come from private breeders. If water comes from a stream, the rough or food fish such as carp, buffalo and catfish are likely to come in of themselves. Otherwise, stocking is done from rearing ponds that are beginning to operate on private farms. Within the last year six or more such hatcheries have been established. Very often nature does a pretty good job of stocking. During high water, spillage from the bayous and streams finds its way into the ponds and the fish go with it. Birds are known to bring in fish eggs and even live fish.

Within a few months after a pond is stocked, the harvesting of the fish can begin. At the end of a year, the production is in full swing. At the end of two years, both production of fish and other benefits such as soil conditioning, weed control, and nitrogen build-up, begin to decline.

If the pond is stocked from streams or old established reservoirs, many large fish come in immediately on flooding, and a commercial harvest can be taken at once. Some farmers do some restocking every month, assuring a continuous harvest and cash returns in the off-seasons when prices are highest.

Most farmers fertilize their ponds periodically as needed. One of the tests is to hold the arm in the water up to the elbow. If you can see your hand clearly, the pond needs fertilizer. A good pond fertilizer is ordinary commercial grade 4-4-1 broadcast over the water at the rate of 100 pounds to the acre.

During the first year after rice there is usually enough food for the average fish population. After that there should be some feed dumped into the water. Shorts, cottonseed meal, ground alfalfa and 5 per cent animal tankage are used. The fish should be watched carefully and not more feed given them than they can clean up in a half day. Feeding and fertilization also encourages the growth of plankton, the microscopic life on which the small fish live.

There are about as many variations of the fish-rice formula as there are farmers. Each adds a personal twist to his own operation, and none have been fully and extensively tested to the point where a blanket recommendation can be made for all rice farmers everywhere. Even the exact benefits to the soil are hazy. Claims for this range from the sublime to the ridiculous. That the fish operation does improve the soil is not doubted. Tillage costs are lowered. Yields go up. Land that has been in fish production needs only one discing instead of three or four to prepare it for other crops. The soil becomes soft and porous. It's free of grass and weeds, including red rice, the bane of all rice growers.

Extracting Nitrogen from the Air

Some of the fish die and provide fertilizer. Nitrogen content is increased by excretions from fish and from the thousands of ducks that dot the water in fall and winter. Weeds and grass and other unwanted vegetation die and decay. Marine vegetation eventually becomes a part of the soil, and when the water is drawn off and a crop is planted, earthworms come in, add their castings to enrich the soil.

(*Continued on page* 125)

More Fertilizer for your Dollar

"IF HALF the farmers in this country would just give up, the rest of us would get along fine," was the way a farmer-philosopher summed up the dilemma of surpluses at a Congressional grass roots hearing last fall.

A drastic cure for surpluses to be sure, but by using skillfully the same tool which has been their chief surplus booster, American farmers could maintain and even increase their income while actually reducing overall production. A neat little paradox, but it works. Let's apply it to corn.

Our annual national corn production for the past dozen years has been right around three billion bushels, give or take a hundred million or so. Mr. Benson would be much happier if this whopping big crop would be cut some 500 million bushels a year, trimmed back to say 2,500 million. Here is where we use arithmetic on the paradox. Our present three billion bushel crops are being harvested from some 80 million acres with an average of about 37 bushels per acre. It is this puny average yield that is turning out the surplus. This small yield has been maintained by about 40 pounds of plant food per acre. In the aggregate, this is a 1,600,000 ton pile of fertilizer.

The National Plant Food Institute has figured out that by stepping up nationwide fertilizer use the annual average corn yield could be stretched to 70 bushels per acre and the desired quota of 2½ billion bushels could be raised on a mere 35,700,000 acres, less than half the land now growing the crop. While the per acre application of fertilizer would be increased from 40 to 110 pounds, the total tonnage would increase less than a fourth due to decreased acreage.

Here is what this means profit-wise. The NPFI, working with Department of Agriculture records, estimates that the current cost of corn production is $1 per bushel. If corn sells for $1.40 this leaves the average farmer a 40-cent profit, or a profit of $14.80 per acre on his 37-bushel production. This is a national profit of $1,184 million for the 80 million corn acres.

The institute also estimates that by stepping up yields the cost of production would be cut to 80 cents per bushel, which would leave the farmer a 60 cent profit out of $1.40 corn. Sixty cents a bushel profit on the new yield of 70 bushels would up the profit per acre to $42 and to a new high national total of $1,499 million dollars from only 35,700,000 acres.

This is a purely theoretical approach that is "iffy" as all-get-out, depending upon weather, rainfall, cultural practices and a variety of other factors as numerous as the corn growers themselves. But behind it is a framework of solid fact. The correlation between the increase in production and the increased fertilizer inputs is well established. What the individual farmer should do is to key fertilizer to his own situation. He should learn to spend

American Farmers Can Maintain Income Without Increasing the Corn Surplus

Maintaining Profits by Lowering the Unit Cost of Production

	Production (Million Bushels)	Average Acre Yields (Bushels)	Acreage (Millions)	Plant Food Application Per Acre (Pounds)	Production Cost per Bushel	Profit per Bushel. Corn @ $1.40	Profit Per Acre
Current Production Practices	3,000	37	80	40	$1.00	$ .40	$14.80
Recommended Production Practices	2,500	70	35.7	110	.80	.60	$42.00

his fertilizer dollar wisely and efficiently and make each penny return a profit.

From Theory to Practice

Indiana and Illinois with their 56 bushel an acre average ranked at the top of the Corn Belt states in corn production last year. Let's drop in on a few Hoosier farmers of the better than average sort and see how they handle their fertilizer budget.

James La Bolt farms a quarter section of light colored land near Holton in Ripley County. Ripley County's corn average is less than 45 bushels; yet La Bolt, on a six-year rotation of three years of corn, soybeans, small grain and meadow, has turned in yields of 90 bushel corn, 33 bushel soybeans, and 46 bushel wheat.

How does he do it? "This 25-acre field right here is a good example," he says. "I take soil samples every other year and send them to the county agent to be sent on to Purdue for testing. Those tests have been showing that this ground needs between one hundred and one hundred and twenty units of each of the three principal elements of plant food to grow a decent crop of corn."

Then he tells how he translated these recommendations into fertilizer applications. His third-year corn was given 200 pounds of ammonium nitrate (33 per cent nitrogen) and 500 pounds of 10-10-10 as a plow-down. Then it received an additional 250 pounds of 5-20-20 in the row as a starter.

This kind of treatment brought him a yield of 90 bushels one good year; his average has been 75 bushels. In five years this 25-acre field has made a gross of $11,750. An allowance of $50 per acre per year for operating expenses would make total expenses on this piece for the five years $6,250, leaving a net of $5,500, or $1,100 per year.

On Prairie Soils

If you have a soil map handy, you will notice that some of the rich, black prairie soils spill across the Illinois line into a few counties up in northwestern Indiana. Montgomery is one of these counties and these soils have attracted some of the best corn growers in the state.

Vilas Jacks is one. He moved here back in 1942 because he had heard he could do a better job than was possible in his home county to the north. He didn't get the best land in the county. As a matter of fact, most of his own 200 acres and a good bit of the 400 he rents is the lighter colored "sugartree" land—land which was originally forested.

Jacks is a slight, bespectacled figure, approaching his third score of years. The look in his eye and the determination with which he says it, would make you know, even if you didn't see the evidence all around the farm, that he means it when he says, "I'm for anything that makes less work and better crops." Some of his work reducers are a battery of home-made, self-unloading wagons that can be synchronized with the self-feeding mechanism in his feed bunks to put the feed to a hundred head of cattle in a matter of minutes; huge corn cribs and granaries equipped with every modern convenience for quick and efficient filling and unloading; a complete workshop for keeping this equipment in top shape. And for raising better crops his big tool is fertilizer.

"I've fertilized heavy all my life," he explains. "I've used the stuff every year except one since I started farming. The only reason I didn't use it that year was because we just couldn't afford it. That was in 1934. The chinch bugs hit us the year before and our corn made only nine bushels an acre. So when it came time to put out our 'thirty-four crop, it had to go without fertilizer. Made fifty bushels.

"When I moved down here from up in Jasper County, nobody around here used any fertilizer. They used to say, 'We don't need it here.' But I thought I'd go right ahead with it the way I always did. Then first thing you know everybody was using it."

Indiana has an annual 5 Acre Corn Contest and Jacks' 130 bushels placed him high on the Montgomery County list last year, a position to which he is not unaccustomed. His experience with his 5-acre plot brings out a point every corn grower would do well to keep in mind—the relation of plant population to high production and the absolute dependence of the whole program on adequate moisture.

Jacks explains that he had 22,000 stalks per acre on his 5-acre

Precision is the word for Richard Ward's farm operations. Here he runs a moisture test on a batch of corn in his drier. His fertilizer applications are tailored with equal precision. Hauling fertilizer (opposite page) for bulk application can save money for the farmer, if large quantities are used.

Clint Wilkins (left) and his hired man, Arvil McDonald, hold a tractor seat staff meeting to recheck their fertilizer requirements. In Wilkins' opinion there is no substitute for a soil test to make the fertilizer fit the crop.

plot. This plot received a plow-down application of 100 pounds of ammonium nitrate, 100 pounds of triple superphosphate and 400 pounds of muriate of potash. As a starter it got another 60 pounds of 8-32-0 in the row. This 5-acre piece was measured out of a 20-acre field. Jacks raised corn on the remaining 15 acres, too, but he cut his population down to 18,000. These 15 acres received the same fertilizer treatment with the exception that he used only 100 pounds of muriate of potash. The reason for this smaller dose of potash was that his soil test showed that he needed the 400-pound application to remedy completely its potash deficiency. He felt he could afford this treatment on an intensively worked 5 acres, but that he might do just as well to attack the problem more gradually on his larger acreage.

The point of the contrast between field population, though, is that on an overall basis, a comparison of the entire 5 acres with the entire 15 acres, Jacks found that the 18,000 population, by actual weight, gave him more corn per acre than did the 22,000 population. "We just didn't have enough rain to make the plant food available," is the way he looks at it. "We had a three-quarter inch rain the evening before the Fourth of July and that was all until the first of September."

Separate Materials

Jacks says his preference for separate materials over mixed fertilizers is almost entirely an economic matter. He is close to the Indianapolis plants and has a 3½ ton dump truck in which he can do his own hauling. This, plus the cash discount he gets, saves him in the neighborhood of $8 per ton on his plant food. He points out that if potash is his chief need, 100 pounds of muriate of potash will deliver as much potash as 600 pounds of a mixed product like 10-10-10. Whereas the triple 10 costs upwards of $60 a ton, he can buy the muriate for $44.

"You get more for your money in the raw goods," is the way he looks at it, "and you can do a better job of tailoring your fertilizer applications to your soil tests."

Summarized, the complete Jacks corn formula goes like this: He follows a four-year rotation of corn, soybeans, small grain (wheat and oats) and clover; and he puts out 150 to 220 acres of corn every year. His plow-down applications of fertilizer start around the first of March, with the nitrogen usually going on last.

Plowing is held to a depth of 7 to 8 inches. The corn is planted in 38-inch rows at the rate of 1 bushel to 6 acres, giving a population of not more than 18,000 plants to the acre.

In cultivating, the first go-round is with the rotary hoe, an implement which seems to be universally popular in Montgomery County. Then the field is worked twice with the cultivators in a particular effort to discourage grass which Jacks brands a real pest; and, finally, it is sprayed with 2,4-D.

Jacks' recent soil tests indicate that his

"We're still a little deficient in potash in that field," Vilas Jacks tells helper Loyal Delano as last year's corn pours into a self-feeder.

The first step in guaranteeing a profitable return from the fertilizer dollar is to put it to work in a well-prepared seedbed. Good seed planted at a rate to take full advantage of moisture and plant food plus timely cultivation and spraying will pay off with dividends in the crib or bin.

lighter colored soils are still deficient in phosphate. To remedy this situation he intends to step up his starter application this year to 100 pounds of 8-32-0. In so doing he will probably win the wholehearted approval of K. E. Beeson and the other Purdue agronomists who counsel the Indiana farmers on their crop problems.

High potash levels, according to Beeson, can be built up in the soil by broadcast applications, but starter phosphate, he says, "is breakfast food. It should be placed where the seedling has it readily available." This isn't to say that it or any other element should be piled on indiscriminately as a starter. Beeson warns that 50 pounds per acre is the maximum amount of nitrogen and potash that should be placed around the seedling as a starter.

Intensification

Richard Ward is another Montgomery Countian worthy of a visit. This busy young man moves with the precision of the man on a flying trapeze. In this day when every farmer seems to be crying for more land, Ward and his father, Homer, have just sold 525 acres in a determined move to intensify the operations on their remaining 640.

The Wards now feed 280 to 300 heifer calves every year and some 800 hogs and their intentions are to increase these numbers. All of their hay and grain is dried artificially; the hay is chopped and stored in pole-frame self-feeders and the corn and small grains are stored in granaries and bins and moved from field to drier

(*Continued on page* 108)

One of the farmer's best friends, the lady-bug, battles endlessly against our insect enemies

The lady-bug (below) begins her breakfast—a juicy aphid which is still draining sap from a leaf vein. While the lady-bug must mate and lay eggs which hatch into larvae, man's enemy, the destructive aphid, bears living young without mating or laying an egg. When hatched, the larva of the lady-bug (left) looks like a different and monstrous insect; it too is the farmer's friend.

By Josephine W. Johnson

The Lady Bug

As the winter melts northward, millions of small bright red and yellow balls move out from under the snow-sodden leaves. From under pasture rocks or the woody leaves of the winter mullein, the bright spotted lady-beetles, or lady-bugs, or lady-birds, move briskly out into the April light, responding to some mysterious knowledge that their breakfast has appeared on every living twig and green shoot in the land.

Of all the species of insects which we consider *good* the lady-bird is one of the best that man can depend upon to look after his interests in the savage, invisible eating war. Among the creeping and crawling, warty and needled, the forceped and mandibled, piercing, humping, stabbing, the glabrous, oily, hairy, and downy, among the bright-eyed, stubborn, swarming, instinct-driven hordes that inhabit the earth and every green, living plant thereon, the very survival of man has been dependent upon his allies in the insect world.

The lady-beetle, which is carnivorous, has sharp mandibles fitted for munching living meat and not for the slow sipping of sap. When it wakes from its long winter sleep (interrupted sometimes by false spring alarms), it unbends its six, clawed legs which have been folded as though in death against the cold. But the lady-bird's eyes do not open to scan the horizon, for her eyes have never been closed and the horizon is too far for any beetle to see. She cannot even move her big saucer eyes left or right.

A hard, chitinous covering packages her body, covering it completely from the clubby antennae to the claws of her feet, as though it had been dipped in dark varnish with only two panes for the eyes to peer through. This polished package of cuticle in which she moves will not dissolve in water or mineral acids. But, unlike the snails and clams whose rigid houses make them slow and awkward, the lady-bug is jointed and flexible, in spite of the three layers of cement, wax, and chitin that seal her from a generally hostile world. She has a few short months to live her whole life (not counting the sleep) and must live it recklessly or not at all. Her glittering body uses the strongest structural form—a barrel—and her small invincible cylinder withstands all the strain she is likely ever to know.

There are some five hundred varieties of lady beetles. Gathered together in a bowl they would appear as a mass of bright ball-like pin heads, colored and splotched and spotted in pink and white and crimson and orange and black and tan and yellow, with commas and circles and parentheses, with dots, eyes, and no marks at all. Some are round, some oval, some one-sixteenth of an inch in length, some one-quarter of an inch. Some are red spotted with black and some black spotted with red, as the twice-stabbed lady-beetle and some tiny and black all over. There is the *Coccinella sanguinea,* which is bright red with no spots at all, and there is the *Olla abdominalis,* pale maize, almost white, and rare. There is the vedalia lady-beetle, *Rodalia cardinals,* from Australia, whose propagation in California cleaned out the citrus orchards of cottony scale within two years.

Some varieties of lady-beetle, like the common convergent, gather together with their own kind in the winter months. Thousands are huddled together, not for warmth, but to increase the unpleasant odor of each which combines to keep their enemies away. In the western mountains, they cluster by the millions and it is from these mountain homes that the sleeping beetles are collected and shipped to gardeners and farmers all over the country to release in spring.

When the vast sleeping colonies awake, they spread out over the warming stone walls, the damp April logs, and then without farewells to their bedfellows—a vast jumble of males and females—they spread their hard outer wings to the side, unfold their real wings, which are transparent bits of hard gauze that have been doubled in two like a jointed shutter, and disperse in all directions.

Lady-bug eggs crowded together on a leaf

The thin wings beat so fast they are invisible and carry them quickly to their first meal of the season. If the wind is high they may go a mile or fifty miles; or if it is calm, they may drop a few feet from their home; but they cannot miss their meal, for the aphids now, by the providential timing of life, are scattered as thickly as grains of green sand over the green shoots of the April world. To the lady beetle, the aphids are the stuff of life.

The rosy apple aphid, whose body has a faint purplish glow, has emerged from eggs laid last winter on the apple twigs. Because she is the first out on the twig, she is called the stemmother and will mother without difficulty from her own self-sufficient, torpedo-shaped body and without benefit of males, a host of living young. First, however, the aphids (all *she's* now in April) march upward to

(*Continued on page* 114)

Pole barn buildings 40x75 feet; each will house 50 cows

Combination hay drier and feeder; holds 80 tons

Concrete silo 14x50 feet; holds 200 tons

Bull pens and housing for 4 bulls

Milking parlor and milk processing

Three non-freezing electric drinking fountains

Shelter for yearling stock

To the Down East dairyman who keeps his stanchioned dairy barn only a few degrees cooler than his house, the idea of open housing may come as a shock.

A couple of years ago, J. C. Gorman, President of Cedarbrook Farms, Inc., of Bellville, Ohio, was impressed with the good production and good health of the dairy herd at the University of Wisconsin at Madison. Loose housing for that cold climate had been worked out by Prof. S. A. Witzel, of Ag. Engineering.

In planning the loose housing set-up for his own herd Gorman came across some thoughts of Rex R. Bailey of the Doane Agricultural Service. Bailey said, "For a good many years our buildings were designed to keep livestock warm. Recent research has indicated that the problem is not to keep them warm but to keep them cool enough for maximum production. This in itself has materially changed our concept of good breeding types and has done much to lower costs of providing the necessary shelter for much of our stock."

The 15,600 square foot barnyard and building layout, shown in the photographs on these pages, was the result of the joint planning of J. C. Gorman with C. J. Fenzau and W. J. Fletcher of Doane Agricultural Service. It is planned for 100 dairy cows, the high producing Guernseys that Cedarbrook has in its string. It will allow 150 square feet for each cow.

The two basic housing units are pole barns, each 40 x 75 feet, covered on three

Movable feed bunk
Trench silo filled with corn silage; 20x92 feet; holds 300 tons
Trench silo filled with grass silage; 30x92 feet; holds 450 tons

LOOSE HOUSING at its best

sides and roofed with aluminum. These, as well as the entire area, are paved with a hot road mix, 1½ inches thick, on top of rolled gravel.

The hay drier that forms the central unit in the set-up is 26 x 60 feet. It is of pole construction, covered with aluminum and has 2-foot wide feed bunks on each side. The fan is a 42-inch Hartzell and delivers 25,000 cu. ft. of air per minute. The roof has an ample overhang so the animals can eat out of the rain.

The two trench silos are self-feeders, and in addition, the silage can be brought out with a tractor-loader and dumped in movable feed bunks. The sides of the silos are made from 2 inch tongue and grooved wood, pressure treated with permanent preservative. Since they are flush with the ground, they are easy to fill and unload.

The non-freezing electric drinking fountains were made by the Nelson Manufacturing Company of Cedar Rapids, Iowa. They fill as the customers drink.

Last winter was the first that the Cedarbrook cows spent in these new, open-air quarters and they liked it. There was no drop in production; their health was better. Hired help costs were cut two-thirds.

Gorman points out that the only way to be sure of the producing ability of cows is to test them. He has the entire herd on H.I.R. test. "We've put $14,400 into this new loose housing layout," says Gorman, "that's $144 per cow. We don't want anyone around here but working girls."

Jerry Busboom of Filley, Nebraska, looks over a graphic demonstration of terrace performance on his own farm. The top of the hill across the fence was terraced two years ago. Cattle are cleaning up the stalks after the corn crop. Where the terraces stop the gulleys start.

The black line in this oscillogram (a graph made electrically) shows the small amount of strain the outside wheel on a combine must take in rolling over a "V" type terrace. Compare it to the violent shocks, shown by the blue line, which the same wheel gets when it rolls over a plowed furrow.

Roll-Over Terraces

By Fred Knoop

"You say your farm is terraced? Then you'll have to find someone else to combine your wheat. I've twisted the last hitch I intend to on those ornery things."

Ten years ago this kind of back fence talk was occurring so often in the Midwest that even the most enthusiastic terrace builders were getting cold feet. And it was about ten years ago, too, that a new look began to turn up in terraces. In Nebraska the farmers say they invented the "new look" themselves. In Wisconsin, the Experiment Station has facts and figures dating back to 1946 to prove they solved the problem that long ago.

No matter who actually built the first broad-base or roll-over terraces, the point is that this new type of terrace is holding water and making friends all over the country. And more important, these terraces are easy on farm equipment. (See the oscillogram at the top of this page.) There is less strain on a combine rolling over one of these terraces than there is in rolling over a plowed furrow.

Terrace While It's Dry

In southern Nebraska the farmers were making the best use of the dry fall months of 1955 to build the new type terraces, big flat ones you hardly see as you drive along a road. There wasn't much corn to pick; there hadn't been enough rain to make a corn crop. Just south of Cortland, Nebraska, a Caterpillar Motor Grader was busy finishing up terracing a dusty field. It was the last ten acres of the quarter section that Albert Klein farms.

Klein had put down on paper his crop results and he was going over these with Wes Lamb, Soil Conservation Advisor for the Scully Estates of Beatrice. The chart made a comparison of these years:

	1948	1954	1955
Wheat	20 A (15 bu)	14 A (25 bu)	17 A (34 bu)
Oats	21 A (12 bu)	12 A (54 bu)	25 A (20 bu)
Corn	57 A (30 bu)	35 A (67 bu)	40 A (20 bu)
Grain Sorghum		18 A (50 bu)	12 A (30 bu)
Alfalfa	6 A 2 T		
Alfalfa and Brome		25 A 2.4 T	15 A 1 T
Red Clover and Brome		8 A 2 T	15 A Rotation pasture

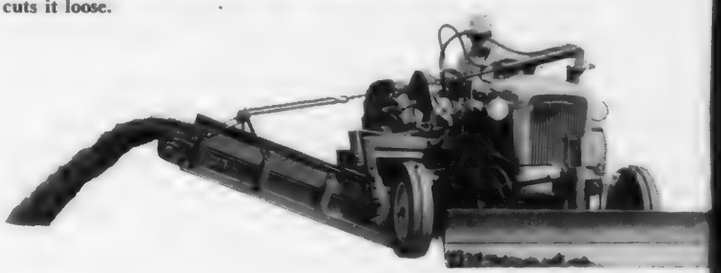
"In 1948 we had an average rainfall here—about 28 inches," said Klein, "but didn't have any terraces. When we got any rain, we got a fast runoff. Now move over to 1954, which was a good year, too, but we were about 90 per cent terraced. Look what happened to our yields. Sure, we had been applying fertilizer. We had done that every year. The main reason for the increases was that we had our runoff under control. Not only did we keep the gully-washer rains from tearing up the fields but the moisture was held longer in between rains.

"Now move over into 1955—a drouth year, with about 8 inches of rainfall—the small grains held up well because the terraced fields had stored the moisture. The corn yield was way down, but ours was as good as any in the county. Our success with terraces has made a lot of neighbors start on their fields."

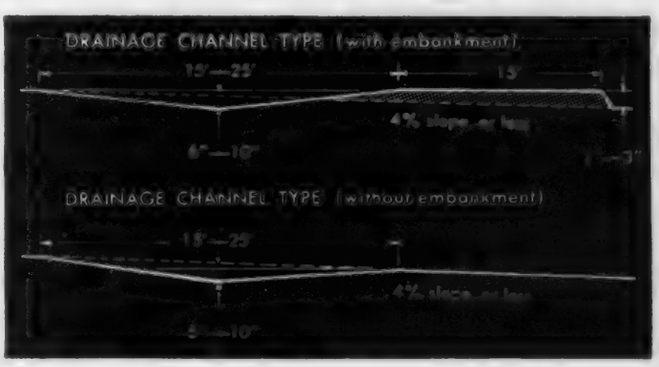
Wes Lamb who has supervised building over 205 miles of the new wide terraces in Nebraska, has this advice for other terrace builders: "We like to use the fall months for building our terraces. You can work the soil without compacting it or bogging down. Terracing can be done in wheat stubble, corn stalks, in just about anything except sweet clover.

"A farmer can use just about any kind of equipment for building terraces if he is willing to find out how to do the job from

Two modern tools for building terraces. Above, the Caterpillar Motor Grader, which can lean, swivel and move dirt in any direction. Below, the Tumaco Terracer moves dirt where it is needed for terrace construction, after the angle dozer blade on the front of the tractor cuts it loose.



A disk-plow (right) mounted between the front and rear wheels of the tractor and hydraulically controlled, makes an accurate tool for cutting terraces. Any plow, scraper or earthmover can be used in building terraces. The chart below shows the dimensions used in building the Wisconsin "V" terraces, described by Professor A. J. Wojta on page 84.



As this aerial view of southern Nebraska shows, the idea back of modern terracing is to make the terraces parallel, so they are easy to farm. The engineer with his level controls this when he plans and lays out the terraces.

the Soil Conservation or Extension Service. Then he must be willing to spend the time that it takes. For our type of terrace, which is a big, flat one, we found we could do the job with a Ford tractor for 3 to 4 cents a foot. Now that we are building 70 miles or more of terraces a year, we have found that our Caterpillar Motor Grader will do a fast and economical job. We are building just about 4800 feet of terrace a day, at a cost of 1 3/10 cents a foot. The ACP pays 2 cents a foot and up to $1500 to a farmer for building terraces, so the average farmer can come out pretty well if he does the job with his own equipment. If he has a contractor build the terrace, it will cost him 3 to 3½ cents a foot.

"We want big, flat terraces," says Wes Lamb, "most of ours are 30 to 50 feet across, including the back slope. We don't try to work on a field with a slope any steeper than 5 per cent. The interesting fact that we have discovered is that the better the terrace design and construction job, the more difficult it is to get a good photograph of it."

For the trip-by-trip earth moving procedure for Wes Lamb's flat terraces see the diagram on page 85.

The Wisconsin Way

Moving over to Wisconsin, another hot spot of terracing activity, we find that the indefatigable Professor A. J. Wojta and his co-workers tackled the flat terrace as early as 1946. At that time, the popular idea in terracing was to make 'em big and formidable. They were engineered to catch and carry off *all* the water on any given field. This method of construction was expensive and it created terraces that were too high and steep for most farm equipment to roll over. Like dikes, they had an annoying habit of giving way in a weak spot during a rainy spell, then the whole terrace drained through the channel that was cut.

Says Professor Wojta: "We decided to meet the problem head on and build a terrace flat enough so that it overflowed all the way along its length in one of our summer cloudbursts. Since we weren't impounding much water at any time, this overflowing action did little damage because it was well spread out. We used the channel type terrace originally developed by Dr. Mark L. Nichols as our basic slope. This is a V-shape, and it is cheap to build since we don't try to terrace any land steeper than a 4 to 6 per cent grade. Our idea in terracing is that it is part of the complete land-forming program needed on most of our farms. We like to use the dirt twice. What we take out of the terrace ditch, we carry to any nearby low spots or potholes, where it can be used in a land smoothing program.

"After all types of tests we have settled on a V-type channel terrace with a 10 to 1 slope on each side. This means," says Professor Wojta, "that if the ditch is one foot deep then each side will be 10 feet. The total width of the terrace will be about 20 feet. In low parts of a field where the V-channel cut does not have sufficient water carrying capacity, the earth from the excavation is used to reinforce the downhill side by building a very flat, wide ridge, perhaps 10 to 15 feet across and only a few inches high. We want to make our terraces parallel and frequently cutting part of the terrace as a channel and using the earth thus excavated as reinforcement or as a flat ridge terrace across the low part of the field, will do the trick.

"Farmers want parallel terraces and they don't want point rows. Layout and building of terraces with these two facts in mind will take time and money, but the effort will be worthwhile. Terraces become a permanent part of the field and can't be redone every year, so they should be built right the first time."

These are the advantages Professor Wojta lists for the flat, V-type terraces:

(1) The V-shape is a natural shape and has the least amount of friction, therefore it will carry the most water for its size.

(2) The V-shape can be built with big or little equipment. There is no problem of leveling off the bottom as in a flat bottom terrace. It requires the minimum amount of dirt to be moved.

(3) A terrace will carry only as much water as its smallest cross-section. The size of a V-terrace cross-section is easy to figure as compared to the more difficult one of a flat bottom terrace.

(4) Any farm implement, except a plow, can be operated across these flat terraces. Plows must be operated parallel to and not across the terrace.

There is a disadvantage to the V-terrace; when it is first built, a rain will tend to cut a ditch down the center of the V. To correct this fault, and prevent washing until the grass is established, leave a little windrow of earth in the center of the V about 6 inches high and a foot wide.

So, the terrace builder can use the V-type Wisconsin terrace or the wide, flat bottom Nebraska type and farm over the top of either if they are built right.

Properly designed terraces divide the runoff and lead off the water so slowly that it cannot carry much soil material with it. The terrace is the only known device that holds soil losses on slopes over 250 feet long low enough to insure that field against ultimate destruction when it is planted in a normal rotation.

We commonly call a terrace "an earth eave-trough." It is laid across the hillside with a very gradual slope, or gradient, toward the outlet end. The gradient of the terrace contrasts with the steeper slope of the field, much as the slope of the eave-trough contrasts with the slope of the roof. Terraces are built across a long slope breaking the slope into a series of short slopes. This suggests the key to the effectiveness of terraces. You can see no obvious erosion on a short slope, but the lower portions of long slopes have multiple shoestring gullies cut by every intense storm when the field is in corn or grain.

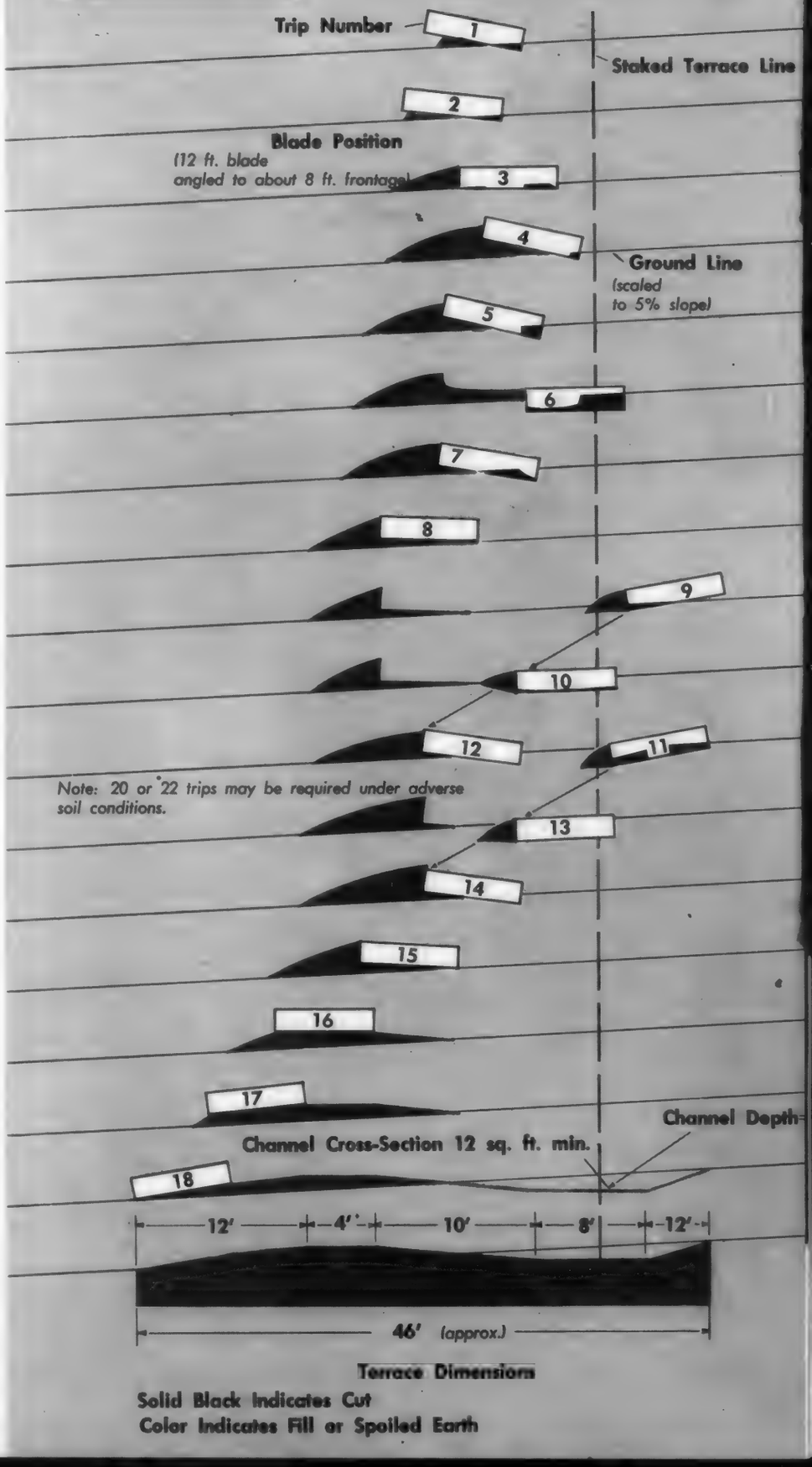
Provide Grass Waterways for Run-off

The runoff water from terraces is discharged into an outlet. The most practical device is a naturally sodded draw or grassed waterway that has been developed to dispose of water that naturally accumulates there. If no such draw is available, one needs to be constructed at least a season before the terraces are built in order to allow time for a dense grass cover to form.

The size of channel is also influenced by the steepness of the hillside on which it is located. A common farm practice is to provide two feet of channel width for every acre of land to be terraced. One thing that can be given due consideration in design of the terrace outlet is that

(*Continued on page* 132)

USING A PATROL GRADER TO BUILD ROLL-OVER TERRACES



Long Grass Silage

Unchopped grass has been made into silage in the plains areas of Eastern Colorado and Western Kansas. Here its keeping and feeding qualities are now on trial

FARMERS don't have to be sold grass silage. Grass silage itself (chopped grass, that is) did a good job of selling and is a permanent fixture on most dairy farms. *Long grass* silage, often regarded as a poor relative, has its points, too. One hears, from time to time, that long grass silage is superior to the chopped variety—in palatability and nutritional values. Is this true, and is there a case for long grass silage?

As far as can be determined at this point, and little enough has been done by the agronomists, there is no definite data on long grass silage based on controlled tests except that the outlay for machinery is less than for chopped silage.

All that can be told, therefore, are the stories of farmers who now work with long silage but have no accurate comparative records. In 1952, Harold Prarie, Jr., who milks cows for a living on his Lawrenceville, New York, farm switched his cows from high quality chopped silage to silage made from unchopped long grass. According to Prarie, milk production went up and Prarie promptly switched his silage making 100 per cent to long grass.

Prarie says his cows ate more long grass silage. Just why long grass silage appeared more palatable than chopped silage to Prarie's cows is something that even the experts haven't fathomed. But the reason, (they conjecture) may be that the unchopped forage crops wilt less and go into the silo with a higher moisture content. And silages stored on the wet side deteriorate less than those stored with too little moisture.

Prarie reports that his cows ate so much more of the long grass silage that "several of them actually laid down and groaned." After two days of eating long grass silage his cows switched to the king size completely and wouldn't touch the chopped silage as long as they could reach a blade of long. Prarie and his father together make 250 to 300 tons of long grass silage a year.

J. D. Baker on his Gallion, Alabama, farm tried feeding his cows both long grass silage and silage made from chopped crops from the same field and put into the same silo at the same time. Apparently the only difference here was the length of the grass put into the silo. Did Baker's cows know the difference? Baker reports they did. Without knowing exact figures, Baker feels that his cows nearly doubled their silage intake and their milk production began to climb. His records do not fix how much. As long as they could reach long grass silage they refused to touch chopped silage.

Whether long grass silage is the thing for your operation or not depends on a number of factors, most of which can be pin-pointed. This is perhaps the simplest mechanical method of making silage. The farmer simply cuts the silage crop and stores it in a box or trench silo. The tower silo is out of the picture because long grass is too difficult to get into and out of such a structure. Long grass silage can be made with hay making machinery. You need no field chopper and no blower. Essentials for the job are a mowing machine and windrowing attachment and buck rakes or baler to pick up the bulky, freshly cut forage. An old-fashioned loader works well, too, but you have weight to handle, and a tough job unloading and packing.

The buck rake is practical on short hauls. The trench silo should be loaded to keep buck rake trips from field to silo down to a quarter mile or less. The rakes seldom carry more than a half ton of grass and a long trip with such a bite size load increases silage costs. If a buck rake is used for hauling, the hay is mowed and picked up out of the windrow. There are new buck rakes on the market that unload the long grass by pushing it off in ribbons as it is hauled through the trench silo instead of dumping it and leaving it for hand spreading. When long grass is unloaded from a wagon, the load is hand pitched off as the wagon is driven through the trench, or pulled off by a cable. A self-unloading wagon or a dump truck makes unloading easier, but with a dump truck, spreading is harder.

(*Continued on page* 171)

Baled long grass silage (above) eases the problem of loading and unloading the silo, but care must be taken to pack well so that no air is trapped between bales. Livestock will self-feed (left) long grass silage if the daily ration is chopped off the exposed edge. An electric wire prevents tramping. Cows rarely have the fortitude to pull long grass out of the silo.

HOW TO BUY AND FINANCE AN IRRIGATION SYSTEM

EVERY MAN has temptations in his life and most of them he manages to resist. The limit of resistance was reached in April, 1955, by Bill Johnston when he saw an ad in his county paper offering new irrigation equipment for as much as 40 per cent off the list price—he decided to take the plunge. All during the crop year of 1954 he had been plagued with drouth and, just to rub it in, there was the East Fork running right past his fields with enough water to irrigate ten farms his size. Johnston had learned enough about sprinkler irrigation systems to be completely sold on the idea and, like any sensible man, he was looking for the best possible buy.

By the end of the irrigation season, Johnston had a working system. It wasn't the best system for his farm; it was more expensive to run than it should have been; it had cost him about 10 per cent more than he would have paid by buying from a dealer, what with engineering and replacement costs, but he had a system. He had also learned a basic lesson. You just can't go out and buy an irrigation system like you would a tractor—each system must be tailored to the farm, to its soil, and to the crops that are being raised. But, like a tractor, an irrigation system works like a machine with all of the parts planned and fitted to operate together. No man in his right mind would buy a ton of assorted tractor parts and expect to put them together to pull his equipment. Yet farmers do bite on the engineer-it-yourself sale of cut-rate equipment.

The simple layout of a sprinkler irrigation system has deceived many a man into believing that putting one together was child's play. After all, the basic parts are not particularly complicated: a pump with a power unit of some kind at the water source; a main line of aluminum, plastic or other light-weight pipe to carry the water to the field and down the center of it; lateral lines to branch off the main to move the water to spaced sprinklers; and coupling devices on each pipe section to make it easy to connect the lines or take them apart for transportation. Why shouldn't a man plan his own system and save the middleman's profit?

Planning Begins With the Soil

Two hard facts are of prime importance in planning a system. First, how much water can your soil absorb without danger of puddling or erosion; second, how fast are you going to have to go over your land to take care of the needs of your irrigated crops? Your soil may be open and sandy and drink in the water like a thirsty elephant, which would permit you to use giant sprinklers capable of pouring an inch of water on the land each hour; on the other hand you may find that two-tenths of an inch or even less would be ideal for your land.

The crop which will cover the soil and the rate at which the soil will absorb water dictate the size of the sprinkler that should be used. Each sprinkler has its volume of output and its own distribution pattern—that is, it covers so much ground—and the area covered determines the spacing of the laterals along the main line in order to water all of the field. Another problem that enters in here is wind, which will blow this pattern awry. Prevailing winds must be taken into consideration and compensations made for them in the spacing of the sprinklers and the laterals.

The amount of water that a farmer will have to use on his crops will vary over the country, depending on the crop, the rainfall in his area, and the length of the growing season. In the Pacific northwest, for example they figure on a growing season of from 210 to 250 days and have found that alfalfa, a heavy drinker, will consume 32 inches of water while sweet corn will use around 14 inches. A few hundred miles farther east, in the Intermountain region, alfalfa will use 44 to 52 inches of water. With different crops requiring different amounts of water and with variations in the amount that must be applied depending on the rainfall, a farmer will have to get the answer to how much water he will have to apply from his state college, the local Soil Conservation Service, or his county agent. A number of the states have published the water intake capacity of the soils, the water consumption of crops in the area, and the depth to which water should sink into the soil for each crop.

With this information assembled, the designer of a system begins to get a picture of what the layout must be. He knows how much water *can* be put on the soil, how much *must* be put on to satisfy the needs of the crop, and how rapidly the system must be moved over the farm to finish one irrigating cycle before the crops which were watered first start wilting. In other words, he has a good idea as to the size of the system—the total amount of water to be pumped and the number of laterals and sprinklers it will take to do the job. He will then be ready to begin the rather delicate job of balancing the different elements to produce an effective, economical irrigation system.

Planning an irrigation system is a job for the engineer; don't bite on the do-it-yourself ads

The mating of the pump with its power unit increases efficiency and lowers operating costs. Safety controls on the engine guard the equipment when the farmer is away.

The Heart of the System

The pump is the heart of the beast; it must suck up enough water from the source of supply and deliver it to the sprinklers with sufficient pressure to spread it out in a man-made rain over the desired pattern. The number of gallons per minute will give the pumping rate of this mechanical heart; the pressure is a different problem.

In figuring the pressure the pump must generate, there are a number of factors to be taken into consideration. First, to start at the outlet end of the system, every sprinkler that is manufactured is built to run at a given pressure—so the kind of

sprinkler selected and the number of them tell the engineer the amount of pressure the water must have when its reaches the sprinklers. But there are many pressure thieves that rob the water of its pressure from the time it leaves the pump to the time it sprays out from the sprinklers. The two most important ones are the vertical rise from the water source to the highest elevation to be irrigated (it takes more pressure to push water uphill than it does to move it along a level pipe and the higher the hill the more pressure it will take): the second major pressure thief is friction. Friction between water and the walls of the pipe will always be

Electric motors compete with Diesel and gasoline engines as a power source for the irrigation pump. Cost of electricity must be compared to fuel and maintenance costs in making a decision. Electric motors are the most economical to maintain.

present, but for any given volume of water, the smaller the pipe the greater will be the friction loss.

Another source of pressure loss will be the number of turns the pipe makes between the water source and the sprinkler. As one engineer, who likes to dramatize these things, put it, "Think of yourself as a drop of water for a minute. You come into the centrifugal pump like the end man on a crack-the-whip and are flung out with terrific force through the pipe. All right. The first thing that usually happens on a poorly designed system is that you hit a right angle turn. It's like running into a brick wall and bouncing off to the side. Does that slow you down and take away some of your forward pressure? You know it. Then you run through the long narrow alley of the pipe, like trying to run uphill through a tunnel that is barely big enough for you to a squeeze through. If the water stopped pushing from behind, you'd soon have the sensation you get in a dream where you feel you have to run, but don't have the strength to move your legs. And finally, you reach the sprinkler and you've got to have enough drive left to pop through a very small hole and leap sixty feet into the air. That is what we want the water in our system to do and it can only do it if we have a pump that shoves the water through the lines with enough force to raise it to the highest point and to overcome the pipe friction along the way."

In balancing friction loss against the size of the pump, the designer of a system runs into an economic problem. The smaller the pipe he picks the more will be the friction loss and the greater will be the pumping pressure required. So, small pipe, which costs less, will require a pump of higher pressure, which costs more, and will result in higher operating costs. Somewhere along the line will be the best balance of pump, pressure and pipe size to do the most economical job.

Manufacturers put out a set of efficiency curves on their pumps to help the engineer balance gallonage with horsepower and engine speed.

And right here, a farmer should think of one other matter that may be a problem in the future. Do you plan to enlarge the system after you have tried it out for a year or two? If you do, you had better plan the big system at the same time you do the small one to make sure that the pipe and fixtures you buy first will fit in with the future plans.

The Power Unit

Once the pump is selected, a power unit must be picked to go with it. And here, again, economics plays a part. The cost of fuel or electric power and the number of hours the pump will be operated during the season are important guides.

An electric motor will probably be the cheapest power unit to buy and to operate IF (1) a 220 volt line runs near the farm; (2) the line is three-phase, if the irrigation motor is to be over five horse power; (3) the cost of a line from the main power line to the location of the pump is not too great (many power companies make a charge of one to two per cent of this cost as a minimum monthly charge for a period of four years), and (4) electric rates are reasonable when compared with the fuel and maintenance costs of operating other power units.

If an internal combustion engine is to be used, a Diesel engine would be the best buy IF the system is to be operated more than 900 hours each season. The Diesel engine will cost more, but will make up for it over a period of time because of its lower operating costs.

A gasoline engine is the best buy for a man whose irrigation system is to operate less than 900 hours a season and cannot be powered by electricity. The operating cost will be somewhat higher than that of a Diesel engine, but the cost of the engine itself will be lower. Since most systems operate around 200 hours a season, gasoline engines have proved to be the most popular power suppliers on the market. When speaking of the gasoline engine, it should be understood that such an engine may also be operated by LP gas, propane, butane, or natural gas. In many parts of the U. S. this is the cheapest and most practical fuel.

The power take-off on a tractor is another source of power for running the pump. This method of providing the power for the pump was rather widely used with supplemental irrigation systems when the farmers of the middle west began that practice. Two arguments are usually leveled against the power take-off. First, farmers are finding it an expensive practice to tie up a tractor during the irrigation season and, second, they have found that for the most efficient operation of the system they have to have a better matching of pump and power source than they can get with their tractor.

This matching or mating of engine and pump is a factor which most often slips by the man who buys his system piecemeal. He picks the pump on the basis of its capacity and finds that it will take, say, a 65-horsepower engine to drive it. So, he buys such an engine or pulls one off an old tractor, couples them together and figures he's made a good deal. But, the pump he bought might well give its most efficient performance at 1800 revolutions per minute while the engine he picked might have to operate at 2,400 to produce the necessary horsepower. When the engine is run at lower speeds it fails to produce the necessary power to operate the pump efficiently. This

Various makes of end plugs, gaskets, and other fittings, as well as couplers, should be compared by the farmer before he decides on the system to buy.

problem has been solved by the pump companies by selling package units of engine and pump which have been mated from the time the pump was an engineer's sketch on a drawing board.

An incidental factor, but one which might save the cost of an engine or a pump is the safety control built into the

unit. Irrigation pumps normally operate for long periods of time without anyone present to take care of them. If something goes wrong, a lot of damage can result. If an engine runs out of oil, it might burn itself out; if the pump loses its prime through a leak in the intake hose, it could be ruined. If a pipe became uncoupled, a fire-hose stream could cut up the field and ruin part of the crop. Safety controls which will shut down the pumping unit if the engine's oil pressure drops or if the engine is overheating or if the water pressure in the line drops, are not very expensive and they insure the safety of the equipment and the crop.

Who Guarantees the System

Designing an irrigation system to fit the farm is a good engineering problem which involves the soil, the crops, the sprinklers, good couplers, and a juggling of pressure with pipe size and pumping unit, but it is even more than this. It is also a guarantee that the system will do the job it was designed to do. It was fortunate that early in the game the sprinkler irrigation industry developed a strong sense of responsibility. From the beginning, manufacturers have insisted that the distributors have an adequate engineering staff and that the distributor stand behind the system he designed. Distributors, in their turn, have insisted that their dealers hire trained men and have run training schools for the dealers.

Speaking through the Sprinkler Irrigation Association, this is what the industry says about responsibility, "When the system is planned by a dealer or his representatives, the dealer assumes full responsibility for the proper design of the system he proposes to furnish. . . . When the purchaser buys the system piecemeal, he absolves all dealers of responsibility for the performance of the system as a unit."

The importance of having a dealer stand behind a system is emphasized by Roy Tribble, one of the country's able, young irrigation engineers who has designed hundreds of systems for diverse farming operations from sugar cane growing in Hawaii to spud raising in Ohio. When asked if he, as an engineer, would shop around for the best possible cut-rate equipment and assemble it himself, he said, "I certainly would not. I might talk to several dealers to look over the couplers, sprinklers, pumps, and pipe that they sell and to get the best price, but I would buy a system from one dealer and expect him to stand behind it. I would insist that he give me a written statement on the system so that there would be no misunderstanding as to what I was getting and what the system would do. This statement would include the acreage to be irrigated, the soil type, the crops, on which I intended to use it, the depth, to which I would irrigate, the inches of water per hour, the number of laterals, the number of acres covered per setting, the pumping time per setting, the number of settings it would take to cover the land to be irrigated and the time involved in one cycle, and the pressure required for operation. I would also expect a complete listing of the equipment involved. When the system was delivered, I would expect the dealer to come out and see that it was set up according to plan and to see that it operated properly. Then, if the system did not perform as it should, I'd expect him to see to it that it did.

"How could I force him to back up his design? In the first place, I wouldn't expect too much trouble because every

(*Continued on page* 167)

How much water can the soil drink? How much water do the crops need? How much protection will the crop cover give? These are the basic questions you'll need to answer when planning a system. Shallow-rooted corn needs plenty of water at silking and tasseling time.

KINDNESS PAYS, IN MANY WAYS

By Grant Cannon

As THOUSANDS of spectators roared, pretty, little Nancy Turner threw her arms around the neck of her steer and kissed him. Then she kissed Dad Weber, the Grand Champion judge of the International, who had just pinned the purple ribbon on Julius making him the winner of the big event for 1955.

The affection and petting that Nancy had given Julius, along with his Illinois corn and supplement, had added weight to his frame and gloss to his black coat. Love makes the world go round, and it also helps fatten steers. But it does even more than that.

The gentle farmer who can hear the bleat of a lost lamb over the monotonous chorus of the flock; who respects the self-centered demand of his laying hens for their dusty, feathery privacy; who can suffer with his cow when she is having a tough time calving; who can return the sluggish affection of a mud-spattered sow, will make more money in the livestock business than a neighbor who sees only the dollar sign on his livestock. His kindness will pay off in more milk from his cows; more eggs from his hens; better conception rates among his cows, ewes, and sows; more virile males, better mothers; faster growing young who make more economical gains; and livestock which can endure rougher conditions without break-down. Beside all this, he will have more fun farming.

Far from being propaganda for the SPCA, these conclusions are drawn from coldly scientific experiments which were designed to learn more about the function of the endocrine secretions.

In one important respect, livestock are people too. They not only respond in a positive way to kindness, but they resent being sworn at and kicked, they grow frustrated when their routine is disturbed, and they get even by sending their owner to the poorhouse. It isn't that they are vindictive; they have no control over the matter. Their response to fear, anger, or kindness is automatic.

Take, for example, the case of the Jersey bull owned by an artificial insemination stud. This valuable animal, which

was stanchioned next to the door leading into the barn, used to amuse himself by trying to hook everyone who entered. Man's response was to get even by swearing at him and occasionally clipping him with a fork handle. But the bull had the last word; he became sterile and refused to breed. Hormones did no good, but when he was moved to a quiet section of the barn he regained his virility and began to produce sperm again.

Then there is the case of the flock of Leghorn hens whose production dropped abruptly when a brisk new hired man insisted on barging through the coops as though he were being paid on a piecework basis. When he had been taught to knock on the door before entering and to move quietly around the coop, the birds relented and went back to producing eggs. And every dairyman knows what happens to milk production when routine is changed abruptly or when cows are mistreated.

Scientists have been trying to find out why these things happen. Much remains to be learned on this subject, but they are sure that at least two chemicals secreted by the body have a pronounced effect. When an animal is frightened or angry—whether the animal be a mouse or a man — it secretes epinephrine, a hormone more commonly known by its trade name, Adrenalin. This hormone is secreted by the adrenal glands which are located near the kidneys. When fear or anger stimulates an extra flow of epinephrine, this hormone seems to trigger a series of little understood reactions, the blood flows faster, muscle activity is speeded up, feelings of fatigue disappear, and, in such animals as the cat, the hair stands on end. We are now learning that when the animal secretes excessive amounts of this hormone it can seriously interfere with important body functions.

The second hormone which is known to influence the productivity of animals is oxytocin. This is a complex pituitary secretion which was recently synthesized by Dr. Vincent du Vigneaud, of Cornell, a work which won him the 1955 Nobel prize. This chemical is best known for its influence on the involuntary muscles of the uterus and on the mamary glands —though male animals also secrete it. When a farmer washes the udder of his cow with a warm cloth, the posterior lobe of the pituitary gland, which is located in the base of the skull, releases oxytocin into the blood stream; within 60 seconds, the cow begins to let down her milk. Oxytocin is also released by the female during mating and causes the muscular spasms which help transport the sperm to the egg.

Little is known as to the effect of this hormone on the male except that in both male and female it is recognized that its release is an involuntary reaction to outside stimulus. The cow can no more prevent the flow of oxytocin and the consequent milk let-down when the farmer pets her and stimulates her udder than the cat can keep a shot of epinephrine from making its hair stand on end when cornered by a dog.

Milk Is A Matter of Mood

Farmers have long recognized that a man could be a good hand with livestock as surely as another might have a green thumb. The knack for getting along with livestock was summed up by the old English proverb, "The eye of the farmer fatteneth his ox." Science has tried to find why this is so and in what particulars a herdsman affects his livestock. The matter of milk let-down is a problem which has interested many of them.

One of the first experiments on the relationship between the psychological stimulation of an animal and milk let-down was conducted forty years ago by Dr. W. L. Gaines, of the University of Chicago, who actually used himself as part of the testing apparatus. Dr. Gaines noted that the milk goat which he was using as an experimental animal gave more milk when nursed by her kid than when milked by hand. In order to check whether this was caused by the method of extracting the milk or by the psychological effect of the presence of the kid, he proceeded to nurse the goat himself and found psychology played a big part. When he milked the goat by hand with the kid out of the barn and then tried to get more milk by nursing the goat himself he got no extra milk, but when he followed this same procedure and let the kid nuzzel its mother, he was able to suck an additional 160 cubic centimeters of milk from the goat. He also found that this last milk contained more than twice the fat content of the earlier milk.

A great deal has been learned since this pioneer experiment. Among other things it has been found that oxytocin causes the cow to let down her milk and that epinephrine stops milk flow. In a recent Kentucky experiment, a cow was given the fright treatment during milking by popping paper bags under her nose and by throwing a squalling cat on her back. The effect was like turning off a spigot. After oxytocin was injected, the flow started again. As a check epinephrine was injected into a cow which had not been frightened; the results were the same. Finally, scientists have checked the blood of a cow that has been stimulated to let down her milk and found oxytocin present. In showing the practical application of this experiment, one scientist pointed out, "The easiest way to dry up a cow is not to milk her or to partially milk her. When she is not stimulated to let down all of her milk; she is only partly milked and the drying up process begins."

On the farm, this same effect has been

observed many times. William Barnes, an Ohio dairyman who has reached an age where he must depend on hired help to run the farm, tells the story of a change in hired men. "When my old man rented a farm and left me," he said, "I was lucky in being able to hire a chap with dairy experience to take his place. I insisted that he follow the same routine and feeding that we had been doing so's not to make too much of a change. I was surprised and darned pleased to find that with the new man the cows averaged around a thousand pounds better during the first year than they had with the old boy. The only difference I could see in their work was that the new man loved cows and the old one didn't particularly. And both of them showed how they were feeling. This new man can walk up to a cow having a hard time calving and help her. The other one couldn't seem to win their confidence; if he tried to help a cow have her calf, she'd get nervous and stop trying herself."

(*Continued on page* 138)

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BRILLION Sure-Stand Seeders cut your seed cost by 50% . . . reduce the usual broadcasting and drilling requirements by ½ or more.

The Sure-Stand does it with Controlled-depth seeding. Every seed is placed within the top ½-inch of soil . . . close to moisture and nutrients. It germinates fast . . . grows strong and sturdy because it is tucked into a firmed, clod-free seedbed prepared by the specially designed, 2-inch notched packer wheels.

It is this once-over combination of accurate seed placement, crushing of lumps and clods, firming of the seedbed that assures a positive catch. It eliminates the seed waste and over planting so necessary with conventional equipment and attachments.

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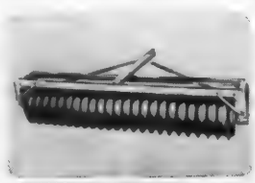

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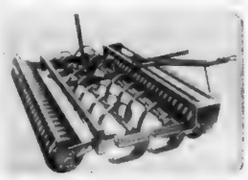

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Send me complete information on the Brillion implements I have checked below:
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LETTERS

(*Continued from page* 18)

Want to Train an Ox?

Sirs:

Concerning G. C. Smith's request for the proper commands for oxen, Mr. Hartung's reply was correct that it is whatever they are trained to obey. However, I do not feel that the subject has been treated with your characteristic thoroughness. Certainly, you should mention the words used by the New England Yankees to get their pioneering done, their wagons of settlers' goods to the Western Reserve and later their immigrant wagons over the trails to Oregon, California and Santa Fe. These commands are still in use in New England on the approximately 2,000 yoke unsurpassed in the woods for hauling out logs and sap sleds in the forested and hilly sections.

These words, I believe, are ancient Anglo-Saxon in origin and I spell them as they are pronounced, not as a scholar would spell them. To stop: "Whō." To start forward: "Wah Highsh." "Back" to go backward. To turn right: "Gee." To turn left: "Haw." It is the vowel sound they obey. "Wah Highsh" is frequently corrupted to "Highsh" or "Hush" (perhaps "Mush" of dog teams comes from this).

In England "Gee" means away from the driver, "Haw" toward the driver. On the road the driver walks on the side next the approaching wagon so as to greet the approaching driver and see that there is sufficient clearance for the approaching vehicle.

It is surprising how little literature is available on training oxen. Ox drivers do not care to write about it and few college professors can drive oxen. The skill in training and driving is not widespread, being generally handed down from father to son.

The farm boy of 12 who overlooks the opportunity of training his pair of steers is missing a lot of fun. They are interesting, affectionate and good pals. They provide plenty of healthful exercise, are very handy about the farm for

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small jobs of hauling, plowing, breaking trails in snow, getting out manure on ground too soft for tractors or horses. Hitched to light wagons they can be used on soft ground, can be bitted and harnessed, saddled and ridden and, when older, sell for excellent beef. Mature animals gently handled can haul surprising loads (9800 pounds on a drag on dirt at the North Eastern States Exposition, 1955) on steel shod sleds.

The ox is the only tractor that repairs itself, burns largely hay and home-grown feeds, sells for more than it cost, has a brain and doesn't get its tires cut in rough woodlots. It is a tractor worth knowing about.

If any boy wishes to train a pair of steers I will be glad to tell him what I know from training my own and from talks with others.

Clifford B. Pool

Western Ave.,
Sherborn, Massachusetts.

. . . And How?

Sirs:

The future of present day farmers isn't too bright. Farm prices are coming down too low for him to make any marginal profit at all. Is it due to scientific agriculture? We surely must be making some strides in new methods of farming if the number of farmers is decreasing while the population is growing tremendously in numbers and we are giving food away, millions of tons of it at a clip, to foreign countries like we never have before.

Is it truly because the average American isn't eating as much per capita as he did? Isn't it in many cases the fact that he doesn't get what he wants and really needs for the health and growth of his body? Is this due to the fact that under our economic system there can't be a fair distribution of the national income to the many hungry people?

Shouldn't we have protection for the ultimate consumer in the wild rise of market prices and the increase of his many more needs while the chances of his earning a living decrease?

Can we through a well devised and planned economy send Santa out to everybody on Christmas? Isn't that what we want to do? Can you help us do it and how?

Lewis Cecil

Midlothian, Maryland

OUR ANNIVERSARY

(*Continued from page* 46)

we like best? Each editor here has his choice; on some of them we would all agree. Which ones have you, as a reader, found most helpful; which the most enjoyable in the beauty of the pictures or the writing?

As we approach our second decade we feel that the pace is quickening. Automation will surely grow on the farm and reduce the sweat and callouses which have always been the farmer's lot. Solar energy will be tapped to add the power of the sun to our insatiable thirst for mechanical production. Disease resistance will be bred into our plants and livestock. Unknown growth factors will be discovered to help us increase our feeding efficiency. Specialized machinery will be invented to take over a larger part of the work load.

As better tools come along and finer animals are bred and new ways to feed our soil and our stock are discovered, we'll be there getting the information and pictures for you. And we shall, as we have during our first ten years, dedicate our efforts to the ideal that farming is the best of all possible ways of life.

Finest tractor ever built

IS NOW FIRST AVAILABLE WITH A

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Sheppard DIESEL

The Sheppard Diesel SD-4 is more than just another tractor. It's a new way to farm. The Sheppard SD-4 brings to agriculture what the production line brought to industry. It multiplies the output of labor . . . more than doubles the effectiveness of its operator.

The Sheppard SD-4 will restore farm profits by directly reducing the two biggest items of farm expense. It will enable you to do your work with fewer tractors and less hired help. For proof read the complete SD-4 story on the following pages.

*Available as optional equipment at extra cost.

YOUR SHEPPARD DEALER WILL GLADLY DEMONSTRATE HOW

You Can Use a *Sheppard* SD-4 to do any job on your farm

get the SPEED, CONVENIENCE, ECONOMY possible only with the exclusive features of an SD-4

10 SPEED TRANSMISSION

GETS THE MOST OUT OF TRACTOR IMPLEMENT AND DRIVER

Built by Sheppard for exclusive use in the Sheppard SD-4, it provides complete flexibility of power with the widest available choice of ground speeds. With less spread between gears, the Sheppard 10 speed transmission insures a closer gear fit for every operation . . . for every operating condition. Often a higher "in between" gear with its greater speed can be used resulting in more work finished in any given time. With 2 extra slow ground speeds, even the heaviest crop will seldom clog or choke combine or harvester at 1.89 m.p.h.

HIGH RATIO POWER STEERING

GIVES COMPLETE PROTECTION FROM STEERING WHEEL "KICK-BACK"

With Sheppard High Ratio Power Steering you drive with safety over chuck holes, cut-up fields or plowed ground. You drive relaxed, free from the tension of guarding against a "kick-back" of the wheel. Sheppard High Ratio Power Steering virtually eliminates all steering effort, increases tractor maneuverability to an amazing extent. You make complete "about-face" turns at row ends with one hand, other hand is always free to operate tractor and implement controls.

THE FIRST Torque Convertor*

in a wheel type farm tractor is available now in the

Sheppard SD-4

The Sheppard Diesel SD-4 is first to offer the many advantages of true torque convertor power. A Sheppard SD-4 with TC automatically matches engine power to load demand . . . quickly substitutes *pulling power* for *ground speed* as the need arises. With Sheppard TC, you select the gear normally used for the job at hand; you work in that gear until the job is done. If you hit a soft spot in the field or come to a grade, TC automatically increases engine torque as the tractor slows down until you reach the power equivalent of the lower gear necessary to pull through. Gear shifting is reduced 90%, engine stalling is eliminated. For complete information on a Sheppard SD-4 with TC mail coupon today.

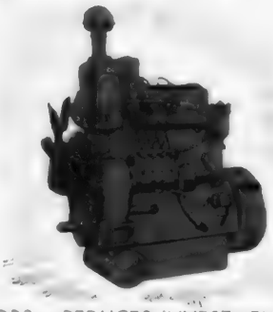
**An optional equipment at extra cost.*

the SD-4 has the most widely proved engine ever to power a farm tractor

This 4 cylinder diesel climaxes Sheppard's 20 years' work developing diesel power for agriculture. It incorporates all the basic designs accumulated over years of research and refinement by Sheppard Diesel specialists. These designs have been proved in thousands of Sheppard Diesel installations throughout the world.

22 to 1 Compression Ratio results in amazing fuel economy

This is the highest compression ratio in use today. The extreme fuel combustion efficiency obtained with this extremely high 22 to 1 compression ratio is one of the chief reasons why a Sheppard Diesel SD-4 costs less to operate than a small gasoline tractor. In addition, it makes starting easier.



SAVES UP TO 50% ON FIELD TIME FOR MANY JOBS • REDUCES INVESTMENT BY REPLACING 2 MEDIUM SIZE TRACTORS • OPERATES

Its full range of job flexibility means:

- You get the work capacity of a 6 ton crawler
- You have the maneuverability of a small row crop machine

AS A RESULT:

- You can farm with fewer tractors
- You need less hired help

High Crop Clearance
Adjustable Rear Wheel Spacing

with both row crop and wide front axle

The row crop and adjustable wide front axles are fully interchangeable on a Sheppard SD-4. Crop clearance is exceptionally high with either one; 26" for the row crop; 22" for the wide axle.

IT EVEN PAYS TO REPLACE LATE MODEL TRACTORS WITH A

Sheppard DIESEL SD-4

Even though your tractors are relatively new and in good condition you can't afford to pass up the overall savings offered by the *one* tractor custom built to meet *today's* farm conditions.

A Sheppard Diesel SD-4 will enable you to eliminate completely the depreciation, maintenance and operating expenses of at least one tractor *plus* the cost of its operator. Or, an SD-4 will enable you to farm more land making your present labor and equipment more productive . . . more profitable. Ease the squeeze on your farm profits . . . buy a Sheppard Diesel SD-4.

Mail this Coupon

SHEPPARD DIESELS • HANOVER, PA.

Send me free 12 page booklet which fully describes the Sheppard Diesel SD-4 with Torque Convertor ☐

Also include literature on the following:

☐ Moldboard Plows ☐ Cultivators and Planters

☐ Rear mounted tool bars and equipment

Name_____

P.O._____

R.F.D._____ State_____

I farm_____ acres; principal crops are_____

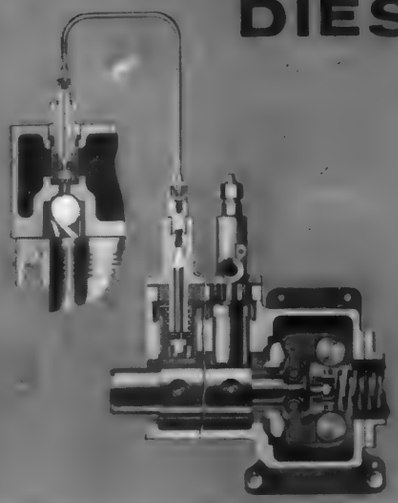
Have your dealer contact me for a "no obligation" demonstration ☐

AS ECONOMICALLY AS A SMALL GASOLINE TRACTOR

ONLY THE

Sheppard DIESEL SD-4 TRACTOR

has the famous Sheppard Simplified Fuel Injection System



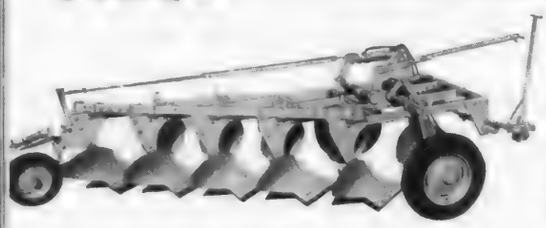
Sheppard's specialization in diesel power has produced the only simplified fuel injection system that can be serviced in the field, without special tools. It has no complicated assemblies. It uses a minimum of moving parts. It is actually less complicated than the electrical ignition system and carburetor in your car. Through simplicity, the Sheppard fuel injection system has become as fool proof as a mechanical device can be. With the simplified Sheppard fuel injection system, the SD-4 actually presents fewer service problems than any other tractor . . . *gasoline or diesel.*

Sheppard FARM IMPLEMENTS are built in the Sheppard Diesel Tradition of "make 'em strong . . . but make 'em simple"

To enable SD-4 owners to realize the full work capacity of their tractors, Sheppard has developed a line of basic farm tools to match the rugged, heavy duty construction of the SD-4. Each of these implements offers revolutionary new designs that will set the standards of comparison for years to come.

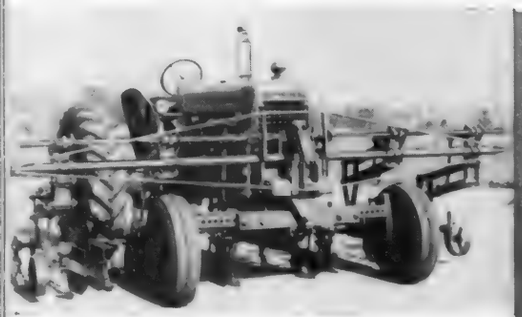
NEW SHEPPARD MOLDBOARD PLOW

CONVERTIBLE TO 3-4-5 BOTTOMS



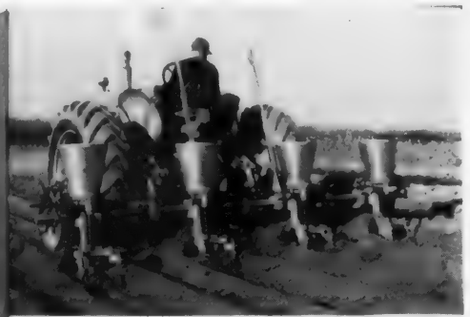
Delayed action pickup starts and finishes all furrows on a straight line. All wheels are roller bearing equipped. Oversize disc coulters have compound angle permanently preset at factory. 26" trash clearance. Automatic tail wheel with spring loaded lock.

This new Sheppard plow uses an entirely new 14" bottom with an angled nose share and closed frog. Replacement shares cost less than any on the market.



SHEPPARD CULTIVATORS AND PLANTERS

Available in 2 or 4 row models with a wide variety of ground tools to suit every soil condition. The same cultivators fit both the row crop or wide axle Sheppard SD-4. The Sheppard Toolsaver Trip Shank offers positive protection to ground tools. Planters mount on the basic cultivator frame. Ground tool arrangements for planting practically any crop in any type of soil.



SHEPPARD TOOL BAR ATTACHMENTS

include cultivators, planters, middlebusters, subsoilers, chisels and field cultivators. Tool bar, with Sheppard Time Saver Hitch, can be put on or taken off in less than 20 seconds without moving from the tractor seat.

◀ **FOR LITERATURE** *giving complete information, mail coupon on reverse side.*

SHEPPARD DIESELS • HANOVER, PA.

Stock Points: Conveniently Located for Prompt Service

THE HOMESTEADERS

(*Continued from page* 64)

two stores, a restaurant and pool hall—wasn't particularly alluring even had our finances and love for riding a lumber wagon all day in the cold been stronger.

Fortunately, we both enjoyed reading. That helped keep us from tramping on one another's corns during the shut-in weeks. We also discovered the fine art of being good company for ourselves, a blessing that might otherwise have escaped us.

It was that winter that we burnt up several years' hoarding of favorite old magazines. Our woodpile ran down to a splinter during the tail end of a spring blizzard, and I couldn't tackle fifteen miles of unbroken drifts until the storm broke. To eke out our scanty heap of wood, we kissed our treasured back-number library good-by. It would surprise you what good fuel they made when rolled tightly and bound with haywire.

"Irish's straw-built shed was nice for the chickens but she had coyote trouble."

However, the seasons have a way of wheeling along. Spring arrived with a lush mellowness, as if trying to atone for frostbites and gloomy skies and rabbit stew. It lifted our spirits accordingly. When the frost went out, the Reclamation Service gave me a job cleaning ditches.

Our land was on a U. S. Reclamation Project, where the desert is supposed to blossom like the rose and milk floweth through outcroppings of pure honey. Providing, of course, one is able to pay for construction costs, yearly water bills, drainage, replacements, living expenses, taxes and other necessary appurtenances.

There were a lot of jokers in the deck, most of them wild. We figured that out later. Right then, we were too busy gloating over our chance to earn some real cash money. Some of this new wealth bought us a milk cow and a few chickens. Our epicurean tastes went up immediately.

That was the spring one of the big sheep outfits range-lambed near us. They gave us a dozen or so bum lambs. It looked liked a bonanza. We had fresh milk and the lambs were free. Combining the two should set us up in the sheep business at no cost save a little effort. The lambs, unfortunately, didn't seem to take kindly

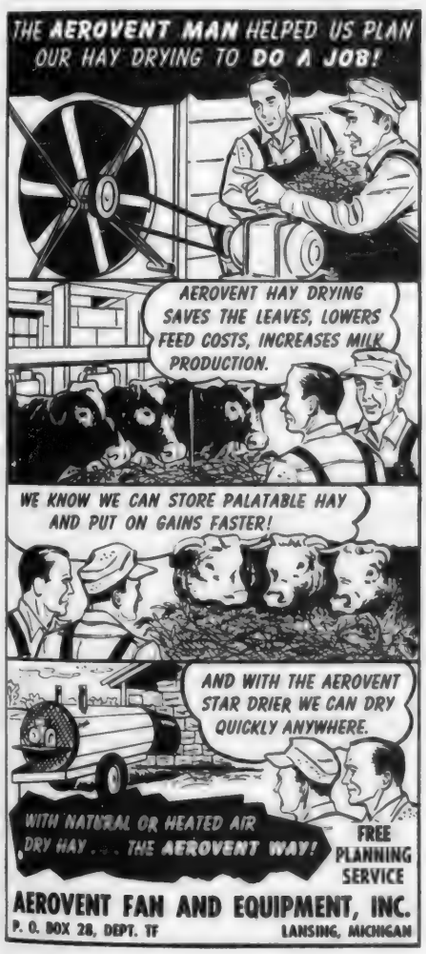
to a two-legged parent. Perhaps their sense of family honor was offended. Anyway, it was only by dint of a box behind the cook-stove, some maternal hovering during the long night hours, and considerable uncensored language, that we managed to bring five of them through to pasture age.

We got the range cattle fenced out that spring, and more land into crop. Yet, our particular area of desert failed to exhibit any of the advertised Garden-of-Eden aspects. Instead, it began to go seepy. Much of such land is heavily impregnated with alkali. Under steady irrigation, it will absorb water until the underground formation brings it to the surface. There it will seep out, bringing the alkali with it, to form a white, encrusted bog. A skimpy form of greasewood will grow in it, if it isn't too strong. Unfortunately, there wasn't much future in the greasewood business at that particular time.

We had noticed a narrow streak of the tell-tale white that first summer. The following spring it began to spread and widen. It spread swiftly, passing the house and engulfing the garden, besides caving in the root cellar and newly-dug cistern. It even discouraged the rattlesnakes.

Grasshoppers and Obstetrics

Our crop was starting out pretty good when the grasshoppers came. They came in platoons, regiments and swarms, organized and free lance, regulars and guerillas.

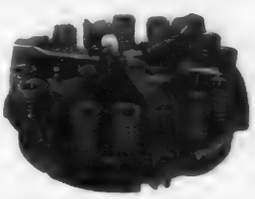

THE AEROVENT MAN HELPED US PLAN OUR HAY DRYING TO DO A JOB!
AEROVENT HAY DRYING SAVES THE LEAVES, LOWERS FEED COSTS, INCREASES MILK PRODUCTION.
WE KNOW WE CAN STORE PALATABLE HAY AND PUT ON GAINS FASTER!
AND WITH THE AEROVENT STAR DRIER WE CAN DRY QUICKLY ANYWHERE.
WITH NATURAL OR HEATED AIR DRY HAY . . . THE AEROVENT WAY!
FREE PLANNING SERVICE
AEROVENT FAN AND EQUIPMENT, INC.
P. O. BOX 28, DEPT. TF LANSING, MICHIGAN

B-W TORQUE CONVERTER IMPROVES PERFORMANCE OF *Sheppard* SD-4 Tractor

provided by the Long-built B-W torque converter now available in the Sheppard SD-4. It gives this tractor the ability to perform work requiring higher horsepower in other non-equipped tractors. The B-W torque converter automatically balances engine output without operator attention to the load for changing contour and ground conditions. Because the engine *always* works in its most efficient speed range, with jolting shocks eliminated, you get greatly increased equipment life with reduced operator fatigue and greater safety.

See your dealer . . . learn how a B-W torque converter-equipped tractor can save you time and money.

YOUR NEXT TRACTOR SHOULD BE ORIGINAL-EQUIPPED WITH THESE LONG-BUILT PRODUCTS, TOO.

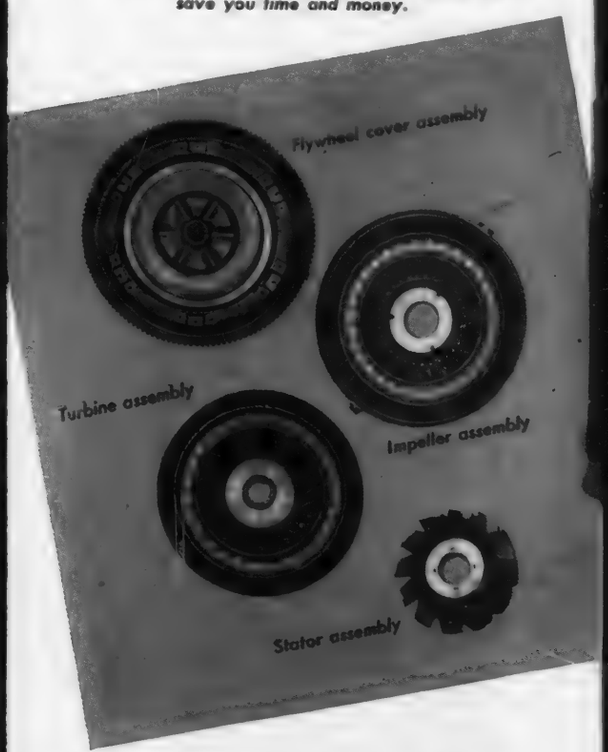


LONG POWER TAKE-OFF CLUTCHES

This compact unit is designed and built to provide accessory and vehicle drive with a single control. Safer; built for long life and trouble free operation; factory adjusted.

LONG-BUILT RADIATORS

The Long fin and tube radiator with its proven reputation for greater cooling efficiency and lasting trouble-free service has become a standard wherever quality and dependability is required. It is used as original equipment by outstanding tractor manufacturers in the United States and Canada.



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Borg-Warner Corporation

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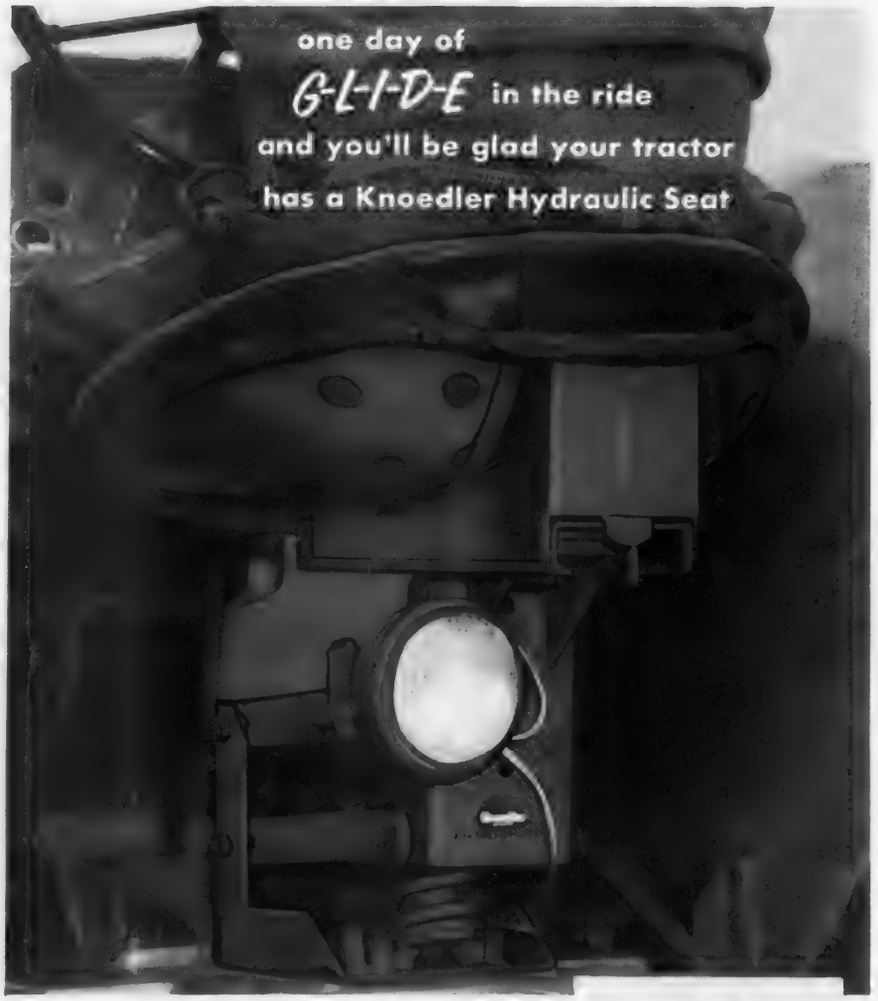
LONG

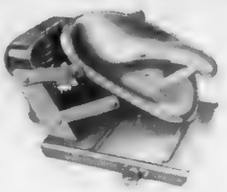


If your new tractor has a Knoedler Hydraulic Seat —one day's riding will convince you it's one of the best features you bought. The freshness you'll feel after eight or ten hours of glide ——— in place of bounce ∿∿∿∿ will prove that you never before had true tractor comfort, efficiency and safety.

Knoedler's special spring-hydraulic action "kills" the jolt and absorbs rebound for a controlled, safe ride. The hydraulic shock absorber is inside the spring and *both* adjust instantly with selective notches. Parallel arm action keeps seat always level as it glides up and down. (Knoedler Hydraulic Seat is protected by U.S. Pat. No. 2432554 and 2531572.)

All Sheppard Tractors have Knoedler Hydraulic Seats factory-installed—the model shown above provides 7" of slide-back travel. (See the big color pages on Sheppard equipment elsewhere in this issue.)

If the factory hasn't installed a Knoedler Hydraulic Seat on the tractor you buy this year, tell your dealer to do it!



This Knoedler Hydraulic Seat fits the John Deere Tractor with battery box seat. Seat slides forward and back . . . battery is still accessible. Over 30 other Knoedler designs fit more than 100 makes and models of tractors and self-propelled implements.

MAIL THIS COUPON FOR INFORMATION

paste to postcard or use envelope

KNOEDLER MANUFACTURERS, INC.
Dept. 77
Streator, Illinois

Send facts on a Knoedler Hydraulic Seat for the following:

MAKE_____ MODEL_____

I am a farmer ☐ . . . dealer ☐ . . . manufacturer ☐

Name_____

Address or R.F.D._____

Town_____ State_____

PUTTING G-L-I-D-E IN THE RIDE FOR AGRICULTURE

Knoedler

KNOEDLER HYDRAULIC SEATS ARE NOW FACTORY-INSTALLED ON ALLIS-CHALMERS motor scrapers, 3805 compaction rollers, CLARK straddle lift carriers, COCKSHUTT tractors, DRAVO-STEEL trailers, EDGEMOOR speed sprayers, FIELD QUEEN forage harvesters, FORD-NEW HOLLAND power units, GALION motor graders, GLEANER combines, HESSTON manure loaders, HOUGH crawler, R-G-F transmissions, I-H-C tractors, JOHN DEERE tractors, KOEHRING-DIXIE DUMPSTER (2 yard, open 11), MARSH-McBIRNEY road pumps, MASSEY-HARRIS tractors, MINNEAPOLIS-MOLINE tractors, OLIVER tractors, PETTIBONE-MULLIKEN motor graders, SHEPPARD tractors, SMITH-DOUGLAS fertilizer spreaders, STRATOMATIC transmissions, WHITE tractors.

We got some turkeys to eat the hoppers, but the coyotes moved in to eat the turkeys. I did get a few coyote hides, but was careful to not let it go any further. I was afraid they might taste like rabbits. Then in the midst of the grasshopper campaign, Irish began to complain about feeling poorly.

It had something to do with what was locally known as a blessed event. This was what caused her to shove me out on the cold floor at 3 A. M. one morning, with orders to hightail for a doctor. I hightailed. My saddle horse took me several miles to a car, then the car went on for the doctor. The doctor, the car and myself all arrived neck and neck with the stork. I knew by her sob of relief that Irish had been pretty scared, but I never knew till long afterward just how scared she actually had been.

Things didn't work out so well a couple of winters later. She had quit making marks on the calendar again, and we were looking forward to its arrival in the spring. Along late in midwinter, we were wrapped up in a thirty-below blizzard when something went wrong. We never knew what. Irish went to bed, feeling upset. As the house was puckered up in its customary stormy night chill, I soon followed.

We lay there listening to the shrieking wind and the roof boards popping with frost, when—Bam! Glass tinkled merrily over the floor. The intense cold, so suddenly contracting the lamp chimney after the light was out, had shattered it into a thousand fragments. Luckily, we had a spare in the cupboard. We congratulated ourselves on this and went back to sleep.

To sleep, yes, but not sleep broken by dawn. In the middle of a balmy springtime dream, I found a determined elbow prodding me in the ribs. Irish's voice shattered the rest of my coma. She was going to be sick, she said, and it was time for all good men to come to the aid of the party.

I tried to argue the matter. It was weeks too soon; some minor disorder had needlessly alarmed her; and the floor was cold. But she soon set me straight. She wanted a fire, some hot water and a light. And she wanted them now! The argument was over.

Thanking my guardian angel for that extra lamp chimney, I got a fire going, broke the ice in the bucket and filled the kettle. It was 2 A. M. and the storm was swooping down fiercer than ever out of a forty-mile gale. To go for a doctor was out of the question. Anyway, there wasn't time. I rolled up my red flannel undershirt sleeves and tied a floursack apron around my copper-riveted Levis.

Then, as I loped madly about, trying to round up everything she thought we were going to need for the main act—Blooie! Away went the second lamp chimney. I guess it had heated up too quickly after its long cold storage.

Still, it takes more than a busted lamp

chimney to stop a rising young obstetrician out to do or die on his first case. The stable lantern was still in commission. It was a bit blinky and had the habit of withdrawing within itself at sporadic intervals, but it represented a light. With it swinging by the bail from a bedpost, I took all three degrees in mid-wifery in about thirty minutes. They were long minutes, though.

I wish I might write a more happy sequel to that long, bitter night. But the little chap found it too harsh a world, improperly prepared as he was to face it. Perhaps an incubator and professional attention might have saved him. We'll never know. We are sure only we did the best that knowledge and circumstances permitted.

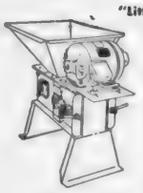
Life and death in a day. A scar for time to heal. I built the tiny casket myself. Our whole-hearted neighbors gave their aid willingly and generously, coming as soon as they heard. We dug the grave up on the hill beyond the house. There he lies, a bitter-sweet memory of a black, storm-swept night.

Those neighbors of ours! I would like to speak of them more fully, only I know no words of mine could ever do them justice. Their time was as limited as their worldly goods, and they had little opportunity for social amenities, but in case of trouble or need, they gathered from all directions, hurrying through the sagebrush on horseback or in wagons, buggies or limber-jointed T-Models. Distance was no object, nor was weather. A neighbor in distress was a call that knew no obstacles. It brought out everything from physical assistance to grandmother's bedspread from the bottom of the old cedar chest. Whatever they had was offered freely, even eagerly, without stint or question.

Everyone turned in and did what there was to be done without stopping to worry much whether he would be able to handle it or not. He usually had to handle it. There wasn't any alternative. Faced by a situation, with no help in sight, one just hitched up his belt and waded in. He probably couldn't make it any worse, and trying might help. The results were pretty good in most cases.

Like the time our cow bloated on alfalfa. She had busted through the fence and stowed away a good load before Irish noticed her. I was on the mountain after

CUT FEED COSTS 20%
WITH THE ORIGINAL "Little Britches" KRIMPER KRACKER



Stop wasteful feeding of whole grain. Roller crimp your grains for greater feeding profit. Amazing, low-cost "Little Britches" Krimper Kracker genuinely roller-crimps any grain for full digestion. Crimping makes grain bulky; makes 4 bu. do feeding work of five. Requires only ⅙ power of hammermills. Wagon box loader optional. Write for free literature, samples and prices.

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Priced Right!
Engineered Right!
Serviced Right!

Streamlined McDowell
COUPLING IRRIGATION SYSTEMS

Note the streamlined McDowell design. No hooks, latches, or gadgets. Water pressure does the job automatically.

Only

Authorized McDowell Dealers Offer
The Original, Automatic, Pressure-Lock Coupling!

If you're interested in portable sprinkler irrigation that works better with less work *and less upkeep*, it will pay you to see your McDowell dealer. He not only offers you the best coupling made, but he also has the experience to engineer and install for you a complete irrigation system that's best suited to your needs and your finances.

Too, every McDowell dealer is staffed to give you fast, expert service and to handle any operating problems that may come up in future years.

• • •

McDowell Couplings and Fittings are available in a full range of sizes for high or medium pressure operation and for gated pipe systems.

"Mac" McDowell—The Rainmaker

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Gentlemen:
Please send, without obligation, free literature on McDowell Coupling Portable Sprinkler Irrigation.

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NOW! Four chicken crate

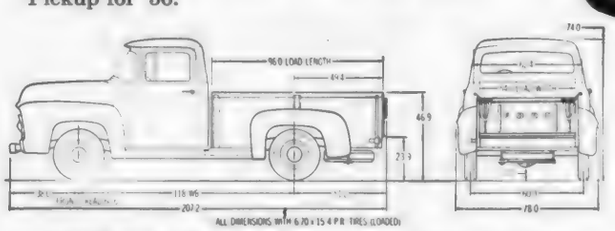
Most horsepower per dollar ...plus exclusive Lifeguard Safety features

The new Ford Pickups for '56 give you more of everything you want in a good farm Pickup.

More capacity, for instance, in the biggest box on *any* half-ton truck. The '56 Ford offers a 65.4 cu. ft. box, a full 8-ft. long, which sells for just a few dollars more than the standard Ford 6½-ft. box.

The new Ford Pickup delivers more horsepower per dollar than any other Pickup—proved by comparison of net horsepower and suggested list prices of *all* pickups. *And only Ford gives you modern Short Stroke* power in your choice of either a Six (133 h.p.) or Y-8 (167 h.p.) engine.

Only '56 Ford Trucks give you exclusive Lifeguard safety features. New *Driverized* Cab has a full-wrap windshield for better visibility, safer driving. There's more style, more comfort, more handling ease . . . more of everything you want, in the new Ford Pickup for '56.

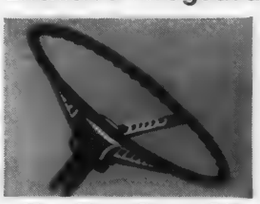


Ford's new 8-ft. box is mounted on a 118-in. wheelbase chassis, as shown above. Standard 6½-ft. box, also available, is mounted on a 110-in. wheelbase.

Holstein cows come plenty big, but not too big for Ford's new 8-ft. box. Tailgate, when level, adds nearly another 20 inches of length to box.

...long! Biggest box on any half-ton truck!

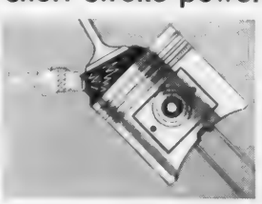
Exclusive Lifeguard safety features!



New Deep-Center Lifeguard steering wheel helps protect driver from steering column in case of accident. Only Ford has it!

New Lifeguard door latches give added protection against doors jarring open on impact. Only Fords have 'em!

Short Stroke power at no extra cost!



Only Ford offers Short Stroke design in your choice of either a Y-8 or 6-cylinder engine. Shorter stroke means less piston travel. This in turn means less friction which leads to less wear, longer engine life *and* greater gas savings.

Fordomatic Drive* can pay for itself!

Fordomatic cuts maintenance costs. There's no clutch to repair, and the oil-filled torque converter acts as a "shock absorber" for the entire power train. It boosts getaway power, *saves time*. And man, what a treat it is to drive with *Fordomatic!*

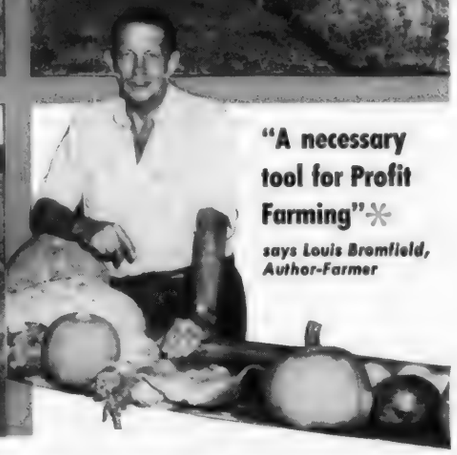
**Available at extra cost.*

FORD ECONOMY TRUCKS

Using latest license registration data on 10,068,671 trucks, insurance experts prove Ford Trucks Last Longer!

SEAMAN ROTARY TILLER

Land clearing at Bromfield's Malabar Farms



"A necessary tool for Profit Farming"*

says Louis Bromfield, Author-Farmer

"A vital part of today's agricultural revolution towards a fundamental and permanent agriculture based upon stable profits rather than erratic prices."

Louis Bromfield, author of the famous book, "From My Experience" uses SEAMAN ROTARY TILLERS in several ways: for quickly and easily reclaiming brushy and weedy land for grass and legumes; tearing up heavy sods for soil-fitting purposes; to chew up heavy sod before fitting the fields to plant small grains or corn.

Mr. Bromfield says, "The Seaman Tiller provides by far the most efficient, economical means of getting the very best results from organic material and sods . . . a necessary tool for profit farming."

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Mr. Bromfield uses his 3 ft. Seaman TILLIT to rip up heavy sod in pasture renovation.

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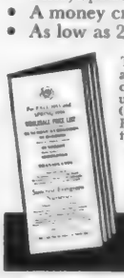

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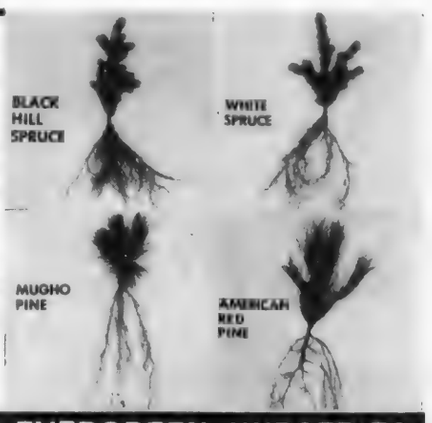


FREE Catalogue and Planting Guide

SUNCREST EVERGREEN NURSERIES

Dept. Q BOX 305 HOMER CITY, PA.

wood that day. Irish was alone with the kid. By the time she got the cow to the corral, the old glutton was swelled up like a politician over his first seat on the gravy boat. Green alfalfa works fast. The cow went down a moment later and started rolling her eyes. It was plumb serious. She was the only cow we had then.

Now, the usual procedure is to stick the animal with a trochar, forward of the hip bone, thus letting out the gas. Alas! we had no trochar. But trust a woman like Irish to figure out a substitute. Irish thought of the butcher knife. It resembled a trochar about as much as a scythe does a razor, but it had a point and was sharp. She carved a lot of cow, and probably punctured a lot of things not in need of puncturing, but she released the suffocating gas. Moreover, the cow survived both the ailment and the operation.

Sickness and injuries among the stock often tested our horse sense and ingenuity to the limit. Maybe we had a tough breed of stock. At any rate, casualties were few. Likewise, the family survived home ministrations with equal vigor.

Most of our furniture was the product of our imagination. We cobbled our own shoes and shod our own horses. We practiced home barbering and made our own clothing. I even made myself a pair of pants one spring, a patch at a time. As a matter of fact, patches might be worked into a coat-of-arms for homesteaders. But for patches, tin cans and haywire, it's doubtful if the Great White Father would ever have been able to settle half the territory he hijacked the Indians out of.

And you can't possibly under-rate baling wire, that priceless commodity, the supply store and repair kit of every homesteader. Without it, there would have been few complete pieces of machinery, harness, vehicles or furniture. It served as nails, bolts, rivets and clamps; safety pins, buttons, hooks and rings; handles, bails, bands, splices and welds; rope, leather, wood, iron and what have you. It often took the place of the entire original object. A wonderful material, indeed! We called it Mormon Whang.

And we needed all the economical substitutes we could find. To buy new stuff costs hard money. We hadn't yet been taught the simple expedient of spending our way to prosperity. In our crude way, we plugged dumbly ahead in an effort to earn the money first. No wonder we made such slow progress.

Yet, that second season showed us gaining a little ground. I found more work with the Reclamation Service on some new construction. The good hundred-per-cent dollars they handed out each month answered a lot of embarrassing questions.

It also furnished a few complications. A man has to be considerable of a stepper to farm an irrigated homestead, still in the making, while working elsewhere. I swapped my bed for a lantern and still couldn't keep up. The new acreage we

had laid out shrunk a half by seeding time. And the crop from that didn't burst any barn seams.

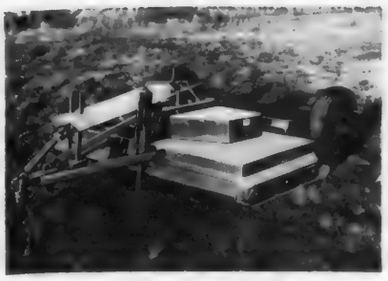
We did have enough to winter our stock, though, by counting forkfuls and sorting the manure carefully. We had managed to get our house lined in the meantime. Also on the black side of the ledger, was a pile of vegetables — mostly potatoes — some husky lambs, a few desert-trained roosters of the mustang type, and a pig which we later fattened on potatoes.

The High Cost of Winning

Anyone who has never eaten a hog fattened solely on raw potatoes has missed an interesting gastronomical experience. It made pretty good sausage, though, if ground fine enough and mixed with plenty of mutton. And it did help break the monotony of potatoes.

Anyway, we came out for the third round, still contending we weren't whipped. We even had enough nerve to buy a bunch of cows on credit. Or maybe it was our creditor who had the nerve. In either case, we felt good about it. That little herd looked wonderful. So did our first calf crop. Rainbows started shooting up all over the sky.

But it didn't last. The seep was creeping steadily down across our best land, taking the alfalfa as it advanced. What it didn't get was quite successfully annihilated by a flood of rank alkali poison the



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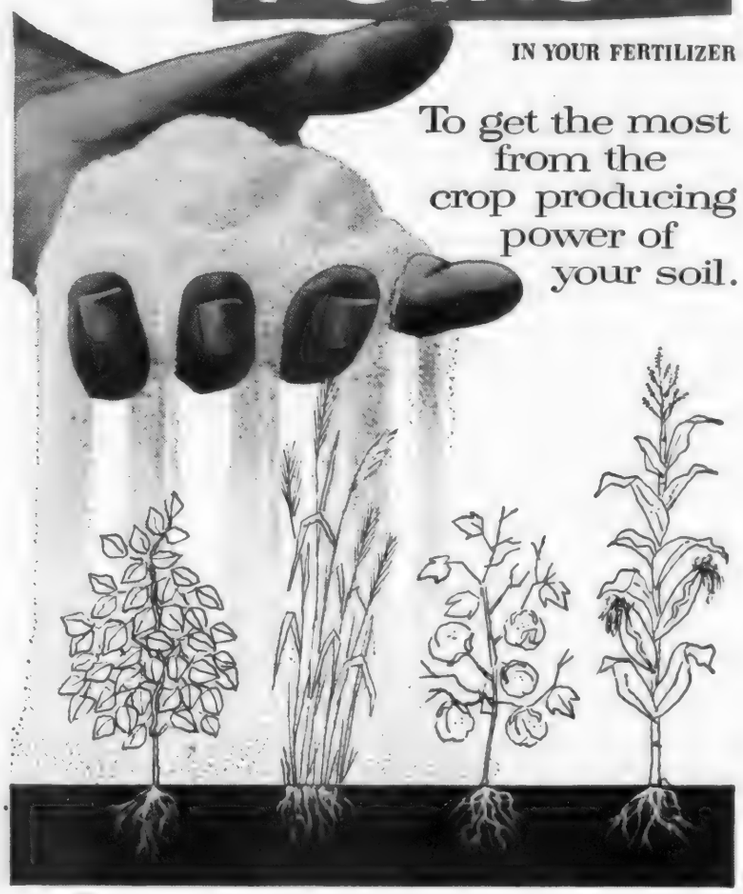

Have you had your soil tested?

The fertility level of your soil is your most valuable asset. Unless you conserve or maintain it by returning enough Potash . . . poor yields, poor crops and poor profits are sure to follow. To protect this all-important crop-producing power of your soil, make sure you supply enough Potash in your fertilizer. Your local agricultural adviser will help determine correct amounts for your soil. And remember, a low Potash level means a low income level. Make sure you insist on enough Potash.

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MEMBER COMPANIES: American Potash & Chemical Corporation • Duval Sulphur & Potash Company • Potash Company of America • Southwest Potash Corporation • United States Potash Company

brains of the Reclamation Service turned loose on us in trying to drain a big body of seep water. That cut our productive acreage in half, leaving us the half that hadn't yet been gotten into production. I think our corps of Reclamation Engineers was the forerunner of the New Dealers' cropless farming idea just a little ahead of its time. They were full of experimental bubbles that usually burst on some plodding homesteader's bowed head. It helped add that little thrill of "what next?" to an otherwise humdrum life.

And this being jerked backward when we were all set for a forward spurt, gave us plenty of new things to think about. Primarily, it meant a two-year job getting the ruined acres cleaned up and back into

"Our neighbors were all wool. They didn't have much, but what they had was ours."

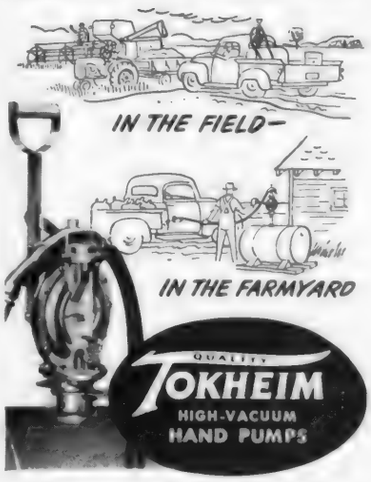
crop. It requires at least one season of intensive cultivation and irrigation to wash and air a heavy accumulation of alkali out of the soil enough to fit it for growing anything. Meanwhile, we had a bunch of cows that figured on doing a lot of eating that winter. They discovered their mistake before spring. That is, the ones who were still interested.

Nor were they alone in finding out things. We kept getting dealt in on something new right along. The land, we learned, had to be built up before it would produce more than one good crop. If it then developed seep, it had to be built up again. Moreover, the designers of the project—all good bedfellows, no doubt—had been far more interested in the extent of land therein than the quality thereof. Their sweeping hypothesis that anything under the ditch was productive blandly overlooked such things as black dobie, gravel deposits, alkali pockets and the like.

Unfortunately, in view of later discoveries, this lighthearted attitude was not shared by sundry unwary settlers. Too often it meant turning the farm work over to the women and kids while they followed the trail of paychecks so necessary to survival. This frequently resulted in manless homes standing lone and somber, months on end, like forgotten toys scattered among the snowbound sage.

The occasional rare sight of a female with a shovel in her hands brings memories of faded, overworked women trying to keep slender crops alive while husbands

BETTER FUEL HANDLING



Here's the most useful pump on the farm. Operates on skid tanks or drums for rapid servicing of cars, trucks, tractors and other working equipment, on the job—in farmyard or distant fields. Handles any petroleum liquid. Pumps up to 20 gallons a minute. Continuous delivery. High suction. Hose or spout outlets. See your oil company or your Tokheim representative today!

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sweated out another grubstake on distant jobs. The whine of raw March winds or the savage lash of midwinter blizzards recalls pictures of wind-whipped, bonneted figures struggling with hay forks and frozen water troughs. Time hasn't erased the haunting loneliness of eyes searching the seldom traveled trails winding across dun-gray sage flats. And ever the bitter alkali curdling the soap in washtubs and turning skins into a fair imitation of rusty iron; or, as dust, sifting through every crevice in unfinished board shacks to make mockery of limited attempts at beauty and homey comforts.

Still, we lived through it. I guess we didn't know any better. There were no social planning wizards to show us the error of our ways in those benighted times. Neither were there any featherbeds set to catch us when our knees wobbled.

And we did make progress, in kind of a stubborn, accumulative sort of a way, until we could look back with a grin of self-satisfied amusement at the long-odds bet we won from Uncle Sam. Things usually worked out like that, back there, when life was simple.

THE AUTHOR: Born in the western prairie country of Kansas, Glenn R. Vernam was transplanted to the mountain country at a tender age. He spent his youth with cattle, pack strings and game trails. A Wyoming girl and the sagebrush homestead cut short for a time his ramblings. After he had proved out his homestead, the gypsy in him got the upper hand again and he took his wife and livestock to Oregon. He does a little writing and he and Irish do a great deal of hunting and exploring.

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This means it is essential that every cow in your herd produce all the milk she is capable of producing, for as many years as she can!

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Your investment in capital, labor and cows justifies a quality feeding program backed by research . . . the famous Purina Program for Dairy Cattle used by thousands of dairymen wherever dairying is big business. See your Purina Dealer for details!

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They show how you can get

MORE BUSHELS OF CORN PER ACRE

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PORTABLE SPRINKLER IRRIGATION

Sprinkler irrigation is the key to stabilized year-in, year-out production of corn and greens on the Tennessee farm of Charles Uhlian. Mr. Uhlian's "push-button" rain irrigation system practically paid for itself in *any one* of the past several drouth years—years when you could step from parched open land covered with dead grass into an irrigated field of dark green cornstalks. Mr. Uhlian does away with about 500 bags of roasting ears a day during the peak season and about 20,000 bushels of greens a year—all on 90 acres.

"Irrigation has done a good job for us on corn and grassland," says W. A. Martin, Ohio farmer who is now turning out 120-bushel corn on land that once wouldn't produce 10 bushels. Portable sprinkler irrigation along with liming, fertilization and rotation has brought out the highest potential in land once too wet to grow anything but poke weeds. Last year Mr. Martin also cut 5 to 6 tons of silage and a ton of hay to the acre on a 25-acre black muck field of oats, seeded to alfalfa and brome and irrigated four times.

No matter where you farm or what you farm, a portable sprinkler irrigation system will help you farm intensively, more profitably. Your dealer who handles strong, lightweight, rustproof Reynolds Aluminum Irrigation Pipe will help plan your system.

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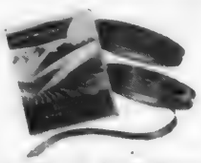

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"By the makers of Reynolds Wrap"

MORE FERTILIZER FOR YOUR DOLLAR

(*Continued from page 77*)

to bin to bunk with the ultimate in streamlined efficiency.

Their corn growing is equally efficient. Ward not only follows the recommendation of his soil tests religiously, but he knows the results he is getting from his fertilizer by using check strips.

For example: "From nineteen forty-seven to nineteen fifty-three we plowed down ammonium nitrate in our corn fields every spring and left check strips without the nitrogen," he says. "Every year the check strips weighed out fifteen to twenty-eight bushels less than the rest of the field. We have both prairie land and sugartree land here and the response to the fertilizer was always greater on the lighter colored soils.

"If you don't do a careful job of testing your soil and checking your yields, you can waste a lot of money on fertilizer, too," he goes on. To illustrate he points to a 10-acre field of Brookston silt loam (prairie soil) that received a plow-down of 800 pounds of 10-10-10 and a starter of 150 pounds of 3-12-12 in 1954. Second year corn went in last year with an application of 250 pounds of ammonium nitrate plowed down and 200 pounds of 4-16-16 in the row. "The thirty-five dollars per acre we spent on fertilizer for that field the first year wasn't justified," Ward claims. "The fifteen dollars last year paid off."

Ward likes to get his plow-down on the field "right in front of the plow." He never side dresses. "I feel I get a more efficient use of my nitrogen when I get it down in the spring. The plants get more benefit from it because the moisture conditions are better."

A short drive up the road past the Ward place, and a jog to the west through the town of Linden brings a man to the Bel Dame Farm of Dick Ward's brother-in-law, another young hustler by the name of Clint Wilkins. Like Ward, Wilkins dries all his hay and grain artificially. He feeds around 100 head of heifer calves and about 700 hogs every year.

He made his debut in the 5 Acre Corn Contest in 1948 and estimates that since that time he has raised his overall corn yields some 20 per cent by soil tests, fertilizer applications and rotations. His contest score this year was 108 bushels.

Wilkins is another man who is a stickler for tailored fertilizer applications. He manures his corn ground at the rate of 1 to 1½ tons per acre, plows down 30 pounds of nitrogen on sod, particularly when that sod has had a heavy growth in the fall. The nitrogen goes on to hasten decomposition of the mass of organic matter. Last year he used 230 pounds of 4-16-16 in the row, is switching to 5-20-20 this year so he can cut back his application 25 per cent and still get on the same amount of plant food.

One of Wilkins' little tricks for stretching the fertilizer dollar is to take delivery in the fall. His granary has a wide expanse of concrete floor with a clearance of some 15 feet or more between floor and overhead bins. This floor was the depository all last winter of tons of ammonium nitrate and 5-20-20, all earning a nice discount simply by waiting out the planting season.

"One of the biggest problems in buying fertilizer," Wilkins feels, "is in getting the exact analysis you need to match your soil test. But with the wide variety of mixes and straight materials on the market today it is getting easier all the time to put on the right amount of potash without wasting phosphate or nitrogen and vice versa."

All of these Montgomery County farmers are stock feeders; some of them even buy corn to fill out their needs, so they are showing no inclination to cut back production. But they give the impression that should they ever care to try it they could make the National Plant Food Institute's estimates of increased profits from fewer acres look like the understatement of the year.

FARM WANT ADS

The new FARM QUARTERLY department is open for advertisements of quality products and services. Rates 75c a word including each word in name and address. Minimum advertisement $18.75 for 25 words including each word in name and address. Terms: Cash with order. Circulation 211,000. FARM QUARTERLY is read by the nation's ablest and most prosperous farmers. Advertisements for the next issue, Summer 1956, accepted until April 15th.

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"Loads the heaviest crops"

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See your local dealer or write direct for further information.

MATHEWS COMPANY
Crystal Lake, Illinois

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MORE PROTECTION AROUND YOUR FARM

with

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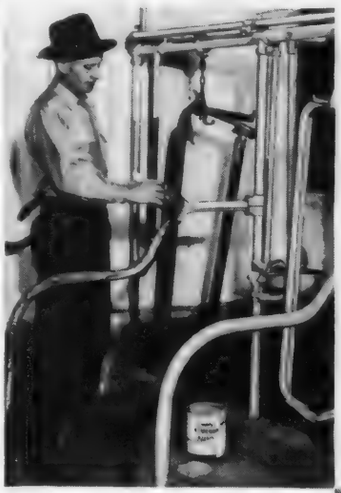

One coat of quality aluminum paint on farm building exteriors, barn interiors, stanchions, tanks, piping and field equipment will protect against moisture, rust and corrosion. Indoors and out—in countless places around the farm—aluminum paint makes surfaces brighter, better looking, easier to keep clean and more durable. It's just like putting on a bright, shining coat of liquid aluminum! Use aluminum paint around your farm this spring to protect and add new attractiveness to buildings, equipment. Leading makes of general purpose aluminum paint are made with genuine Reynolds Aluminum Pigment.

Asphalt-aluminum roof paints and coatings extend the life of built-up and rustable metal roofs. Moisture is sealed out with a coat of metallic aluminum so rusting and deterioration are retarded. Asphalt-aluminum roof paints and coatings also safeguard livestock and help them maintain production because building interiors and shelters are up to 15° cooler in summer. To be sure you get a quality brand, look for the Warranty Seal on the can. It's your assurance of an approved asphalt vehicle containing at least two pounds of metallic aluminum pigment in every gallon.

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THE CARDIFF MONSTER

(*Continued from page* 55)

crowd and Stub's cowshed became the 1869 equivalent of a hotdog stand. Farms in the neighborhood put out signs like "Warm Meals—Oysters and Oats."

Stub and his partner, George Hull, a relative who had appeared out of nowhere early in the scene, turned down an offer of $60,000 from P. T. Barnum and likewise an offer of $100 for a chip off the Giant from a New York collector. A professional showman from Chicago was hired to promote the Giant and under his auspices three different "only authentic and reliable" guides were published in one week.

Finally, a syndicate of local men was formed. This syndicate bought a three-quarter share of the Giant for $37,000. Stub and Hull kept the other quarter. One of the men in the syndicate was David Hannum, the original David Harum of Dr. Westcott's famous book. Dr. Westcott was himself a member of the syndicate.

The Giant was moved to Syracuse, then to Albany, New York, and Boston, showing his naked and mysterious form to thousands. When the Giant reached New York, it ran smack into unexpected competition. P. T. Barnum, that expert on humbug, stepped in and gummed up the works. Not to be discouraged by the refusal of his offer, Barnum had a more-or-less exact copy made in plaster of paris by one C. F. Otto of Syracuse. The fake was advertised as "The Original of all 'Cardiff' Giants" and was put on display at Wood's Museum, two blocks away from Apollo Hall at 28th Street and Broadway, where David Hannum opened with the real Giant. People thronged both places for a while. Hannum attempted without success to get an injunction against Barnum. Finally, confused by the presence of two giants, and beginning to realize that they were being taken in by a brace of hoaxes, the public gradually lost interest.

The Giant went on to Boston, but its drawing power gradually declined and it began a long and spotty career as a public spectacle. By this time, it had been completely exposed as a fraud. From the beginning newspapermen and a few scientists had operated on the theory that the Giant was a hoax, but could find no substantial proof. Stub's family swore on a stack of Bibles that they knew nothing about where it came from or how it got into Stub's clover field. However, many searchers, among them O. C. Marsh, an upstate professor, believed that George Hull, Stub's partner, was the key man. The tip-off for the final exposé came when Stub withdrew a large sum of money from the Onondaga County Bank in a draft to Hull's order. Professor Marsh, like a bird dog on a cold trail, redoubled his efforts and turned up a man in Ft. Dodge, Iowa, who spilled more of the beans. This Ft.

Dodge fellow said he had helped get up the Giant. With the fraud exploding all around them, Stub and Hull saw that the jig was up. They started talking; and a strange tale they told.

Life and Times of the Cardiff Giant

The whole thing started back in 1866 when George Hull, a farmer and cigar roller from Binghampton, New York, was visiting his sister in Ackley, Iowa. One evening Hull got into a hassle with a Reverend Mr. Turk about a Biblical passage, "There were Giants in the earth in those days." Reverend Turk dogmatically accepted the phrase, but Hull, being an agnostic, got madder and madder at such stupidity. He determined to make a giant, palm it off on a gullible world, and confound all fanatics like Reverend Turk.

In June of the next year, 1868, he turned up at the St. Charles Hotel in Dodge City with a friend. They spent a good deal of time snooping around the gypsum quarries, trying to get a block of gypsum 12 feet x 4 feet x 2 feet as cheap as they could. Finally, with the help of a keg of beer and some petty palm greasing, they got out a five-ton hunk in one piece.

Hull's partner took one look at the block of gypsum and backed out on the deal. Hull went on alone. Several wagons caved in from the weight and several teams of horses went to the glue factory from spavins and sprains. Hull had a couple of feet cut off the block and after many setbacks, finally got it 40 miles across country to the railroad.

It was shipped to Edward Burkhardt, a stone cutter at 940 N. Clark Street, Chicago. Burkhardt and two assistants started sawing away on it, roughly following Hull as a model. The skin pores, which had puzzled the scientists, were made by whacking it with a lead hammer full of

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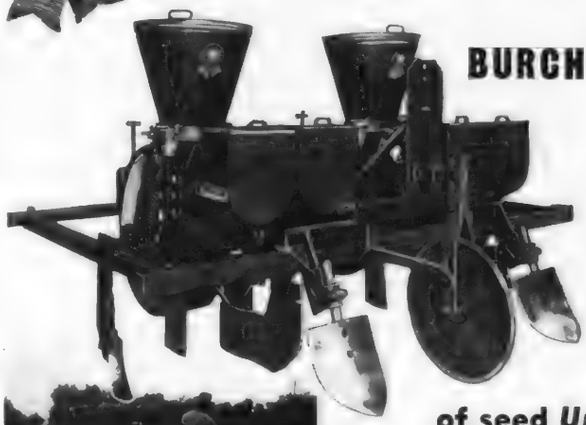

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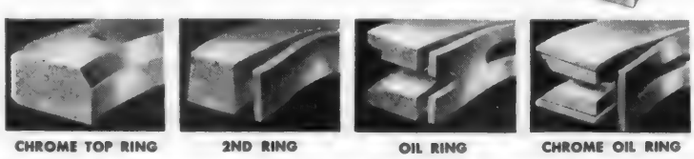

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fine, needle-like points. With sandpaper, acid and elbow grease, Hull spent many hours and days rubbing it down and giving it the appearance of age. He carefully rubbed the grooves in the back to give it a waterworn appearance. The hair stumped them, so they left the Giant bald. When finished, it measured 10 ft. 4 inches in height and weighed 2990 pounds.

It was boxed, the box bound in strap iron, marked "finished marble," and shipped to Union, New York, near Binghampton, addressed to William Newell. Stub Newell picked it up at Union and loaded it on a wagon. On the trip to Cardiff, Stub had to run a gauntlet of inquisitive farmers and tavern crowds. He varied his story. It was "a tobacco press," a "soldier's monument," a "casting." People generally accepted these evasions with a barrel of salt, regarding it as contraband tobacco and none of their business.

One dark November night in 1868 Stub and a twelve-year-old boy buried the Giant. Stub seeded the ground to clover, a most unlikely time for seeding clover, people said later. The winter rains and snows came, and the scar over the form of the Giant was healed. Hull's total expenses had been $2,200.

The Giant was left to cure in his tomb. Almost a year later, on October 18, 1869, Stub called in Gid Emmons and Hank Nichols to dig him up.

After a few tours around New England in the early 1870's, the Giant went into storage at Fitchburg, Massachusetts. Newell had been squeezed out of the Giant's life and Hull had gone back west to bury another giant, this one made of baked clay.

For forty years the Giant gathered dust in Fitchburg. He was displayed briefly at the Pan-American Exposition in Buffalo in 1901. Who actually owned him at this time was somewhat hazy and in 1913 he was sold to Ralph C. Lawrence for nonpayment of storage charges. Then came a long series of owners. Joseph R. Mulroney bought him later in 1913 for $10,000 and took him to Ft. Dodge, his original home. In 1920 the Giant was bought by the Cardiff Giant Association and exhibited at the New York State Fair in Syracuse in 1934. Later the same year he toured the country ballyhooing the picture, *The Mighty Barnum*.

The State Historical Association of New York bought the Giant from Gardner Cowles, Jr., Des Moines publisher, in 1948, eighty years after his disinterment, and placed him on view at his final resting place, the Farmers' Museum, at Cooperstown, which the Association sponsors.

There he rests today, for all to see, the most colossal hoax of rural America, the proof that people want to be fooled. And proof too, that people want to stay fooled; for there are those today who say the Cardiff Monster is a petrified man.

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A completely new and exclusive ROTOTILLER development . . . your assurance of shockproof, trouble-free service and your protection against careless handling. Protects your ROTOTILLER against damage from rocks, stumps and buried obstacles.

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HERE is a 5 hp. ROTOTILLER made especially for auxiliary use on large farms. Snap-on, snap-off tilling unit is *instantly* detachable, together with hood and depth regulator, transforming the machine immediately into a powerful, easily handled garden tractor. Can be used with all ROTOTILLER lightning change attachments as well as any conventional plow, disc or harrow.

This new Model 5 has three speeds forward for heavy duty tillage, fast cultivating, lawn and field mowing and hauling. Detachable tilling unit has extra heavy gearing and is equipped with stone deflectors and choppers.

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THE LADY BUG

(*Continued from page* 79)

the hard green apple buds, plunge in their beaks, and do the best they can outside until the leaves unfold. Then they descend inside the whorl of green-gray leaves and stab away at the stem itself and the almost invisible cluster of forming fruit. The draining of the sap stunts the leaves and they curl protectively above the mother lice, and the apples themselves dwarf and cluster misshapenly in hard little huddles.

Having no memory, no expectation of disaster, only an instinct for pleasure and for the survival of their flatulant little kind, the aphids do not expect to be devoured. Already packed and succulent with sap, their big foolish eyes warning them of nothing, their four sharp stylets inside the grooved beaks plunged into the leaves, happily and mindlessly they pump the sap into their bodies. They look like tiny green paper bags full of water, and are crowded so close together the bags bump one against the other, and the smaller or later-come aphids crawl over the others and stand on their heads to find an unpunctured spot of green. They graze through their peaceful and destructive hours without even turning their heads to see beyond the crowded fat stomachs on either side. The lady-beetle, brisk and hungry, alighting on the nearest apple tree, runs briskly to the nearest leafing cluster, pinches up the nearest aphid in her jaws, and chewing briskly, fills herself deliciously full of apple leaf juice, transformed by the aphid into honeydew. And the possible birth of one billion aphids is drowned in a little bug less than six millimeters long.

Even after the first attack, the herd grazes quietly on, unaware that some fifty more are marked by one lady-beetle for that day's meal. And the next day fifty more, and if the weather continues mild and warm, her munching will mount to seventy, eighty, even a hundred a day, and continue on through April, May, and sometimes June. Cold damp days lay a hand on the lady-bird's appetite and make her listless and unhappy, and these are great days for the aphids, who, unaffected by chill and drizzle, multiply to disastrous proportion until—if they were not poisoned by man—one might almost *hear* them draining sap out of the world.

Throughout the warm day the lady-beetle eats, cleaning her jaws and wiping away the glue which the aphids squirt from their horn-like cornicles in a half-hearted hope to close their devourer's mouth for good. Sometimes a large aphid will walk away restlessly from the meal or twist and slap the lady-beetle in the face squirting her with glue, or struggle too much to render the eating easy, but on the whole the banquet goes smoothly, the aphids devouring the unresisting sap, the lady-beetles the unresisting sap-balloons.

Though man may think of the lady-bird as *good* there are other insects which look on her as the cattleman looks on rustlers. For that is precisely what she is. Some of the countless hordes of aphids are actually herds; herds owned and cared for by the ants. The corn-root aphid belongs to the brown field ant, which gathers the aphid's eggs in autumn, carries them underground and cares for them all winter, moving them about in its tunnels to see they have proper warmth and humidity, and in the spring bears the adult aphids out to the roots of corn. Here the brown ants keep guard over them, and milk the aphids by stroking their sides to produce the honeydew on which the ants live.

The large black ants have herds of aphids also. And suddenly some day as the lady beetle is unwittingly nibbling away at an aphid herd, belonging as surely as though branded to a colony of ants, she will find herself fiercely jostled aside, and towered over by an enemy with jaws as sharp as her own and long black arms. If she is stubborn, she may cling and fight, but if she is wise, she will take instant flight. What is one dish of aphid in a world of food?

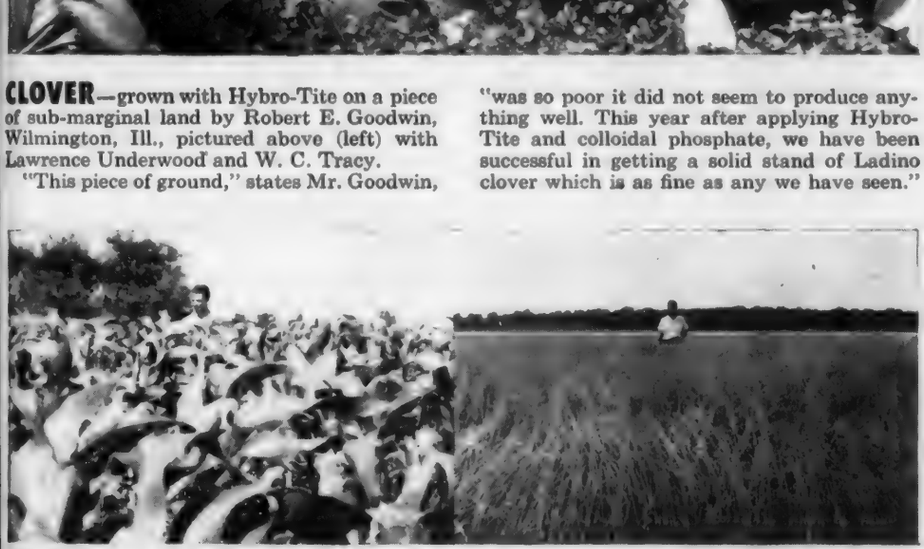
The ants will kill her to save their herd, but not for food. The hungry bird who follows her in her flight to another branch, and lights with the expectation of a juicy meal, will pause and reconsider. For, in the very shadow of his beak, the lady-beetle will squeeze a yellow and evil-smelling fluid out from the joints

CAN HYBRO-TITE'S 19 TRACE MINERALS INCREASE THE PRODUCTIVITY OF YOUR SOIL?

These farmers tell how this natural soil conditioner helps grow finer clover, cotton, corn, oats, vegetables, fruits

CLOVER—grown with Hybro-Tite on a piece of sub-marginal land by Robert E. Goodwin, Wilmington, Ill., pictured above (left) with Lawrence Underwood and W. C. Tracy.

"This piece of ground," states Mr. Goodwin, "was so poor it did not seem to produce anything well. This year after applying Hybro-Tite and colloidal phosphate, we have been successful in getting a solid stand of Ladino clover which is as fine as any we have seen."



CORN responds to Hybro-Tite! H. W. Hostetler, Tampico, Ill., used Hybro-Tite on a test strip. He writes, "The Hybro-Tite corn had a distinct difference in color, being much darker green, and was 1½ feet taller than the check plot which received no application."

OATS stand up well! "Common thought has it," Mr. Hostetler says, "that good oats cannot be grown on deep peat soil. We have 46 acres of this deep peat and this year with Hybro-Tite and colloidal phosphate, we had very good oats that stood up well, yielded 58.9 bu. per acre."

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Ray Clements, Polk County, Florida, found there was "50 per cent improvement in the appearance of these trees," after Hybro-Tite was applied.

COTTON

Lloyd Crafton, Bragg City, Mo., got a yield of 51.1 lbs. more lint cotton per acre, at a saving of $22.00 per acre, from test plot grown with Hybro-Tite.

If your acreage is not as productive as you'd like it to be, read these reports from farmers who have tried Hybro-Tite* with its potash and 19 trace minerals** so often needed to activate the soil nutrients—make them available to foster healthy plant growth.

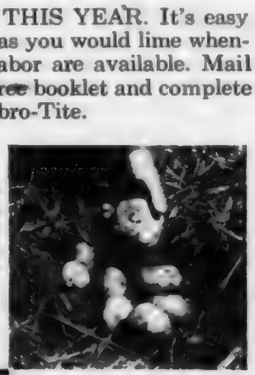
Their tests of this low-cost soil conditioner have *paid off*—in bigger yields of many crops, in finer quality, and in improved production on problem soils.

LOW-COST, LONG-LASTING! Hybro-Tite is a very economical soil conditioner. The first cost is low and its benefits may extend over a period of several years, still further reducing the cost per acre. Hybro-Tite doesn't leach out of the soil—as it weathers, more and more of its minerals are released to help grow better crops.

TRY HYBRO-TITE THIS YEAR. It's easy to use—spread it just as you would lime whenever machinery and labor are available. Mail the coupon below for free booklet and complete information about Hybro-Tite.

POTATOES

—large, smooth, with no sign of scabs, grown with Hybro-Tite by Robert Meyer, Frederick, Ill. He says it's a "natural" to help get top production and quality at lowest possible cost.



VEGETABLES

—from famous Malabar Farm, Lucas, Ohio. "There can be no argument on the great value of Hybro-Tite," writes Louis Bromfield, noted novelist and farmer.

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Attention of Charles L. Davidson, President
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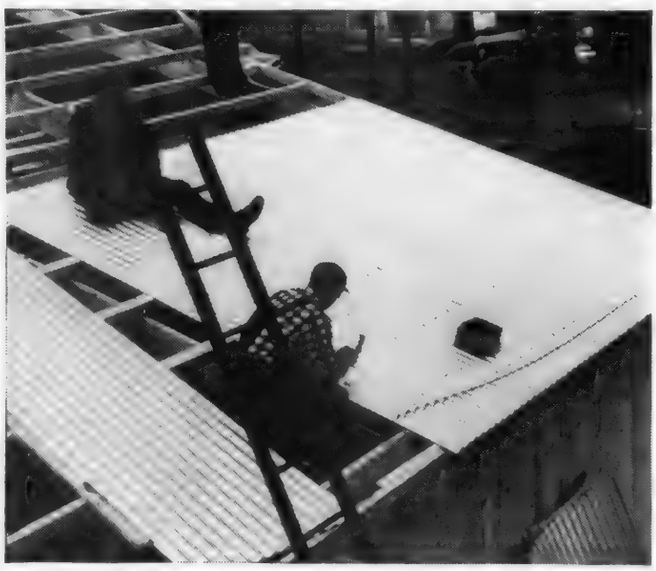

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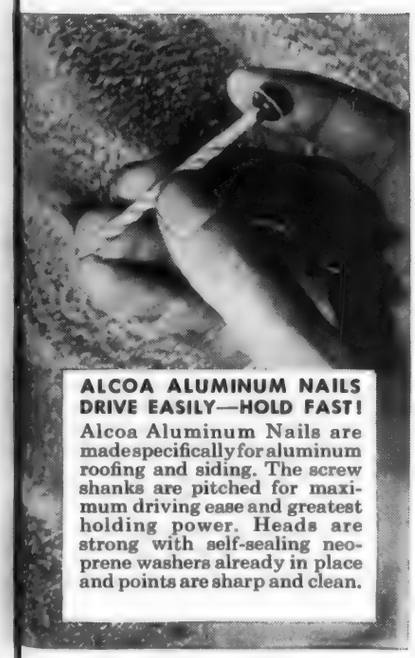
EQUIPMENT!



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IT WILL BE MORE THAN A VACATION TRIP, JIM. WE'VE BEEN THINKING ABOUT MOVING TO FLORIDA, AND PLAN TO LOOK OVER THE FARM SITUATION WHILE WE ENJOY THE SUNSHINE.
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IMAGINE! IT'S THE MIDDLE OF WINTER AND THEY'RE SHIPPING FRESH VEGETABLES. MILKING BARNS AND LAYING HOUSES ARE NOT HEATED, AND CATTLE ARE ON OPEN RANGE. I'M SOLD ON FLORIDA.
AND EVERY FARMER WE'VE TALKED TO, ED, HAS BEEN ENTHUSIASTIC ABOUT FLORIDA LIVING, TOO.
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of her legs, and the odor warns the bird, as her bright spots and color should have warned him before, that she has a bitter, unpleasant taste. Most of the real enemies of the lady-beetle are reserved for her larval stage when, in spite of her hideous shape, she is edible and sought after.

After a week of eating aphids and occasionally a red mite or a nest of the cottony apple scale, and a dessert of the wooly apple aphid, which looks like a bearded balloon, the lady-bird feels full and maternal, and having somewhere along the eating hours found a male—for unlike the aphid she cannot produce her young all alone—she mates, and then eats with renewed appetite. Moving up the stem a few feet, she lays her orange eggs.

By now it is late April. The wild crabs and the hawthorne are in bloom. The bluegrass, the plantain, mullein shoots, the dock and sorrel are rising. The white oaks have their first small silver leaves and the maple tassels are washed down in the cold, intermittent rains. The wild, white plums have come and gone and the earth seems covered with bright, undamaged green, by fresh unbitten leaves. In this interval, the uprushing green wave is ahead of the insect eating wave. It is a short and precarious time.

As the lady-beetle retreats and lays her small clutch of fifteen to thirty yellow or orange eggs, all neatly set on end and crowded together underneath a leaf, all the aphids she has left below her on the branch are likewise busy. The aphids produce their living young without bother of a mate, with scarcely a break in their lifelong lunching. The green young, expelled like tiny melon seeds, all hungry and equipped with beak and legs, arrive in batches of up to a hundred in the week. And within a week, they, too, without mate or the laying of an egg, have added their own batch of leggy young to the ever-expanding colony—which left alone would circle the earth.

While the larva of the lady-bug still lies sealed in the orange egg, the soft stubby winged nymph of the grasshopper is emerging from a hole in the ground; the winged and deadblack mother of jointworms is laying her eggs in the green spring wheat; the elm leaf beetle is biting small holes in the young spring leaves of the elm and laying her eggs for the many-legged larvae who will turn much of the elm to a brown and lace-like ghost. The clown-striped cucumber beetle is feeding on weeds at the garden edge waiting for the first tender melon shoots to arise; and the longwinged pear psylla lays its pear-shaped eggs on the end of a stiff thread-thin stalk, well in time so that the hatching of their hairy crabshaped larvae can take place in a white cloud of honey-scented pear blossoms, and devour what is left from the feather-winged thrips who have been rasping away at the pear buds from a cold, early start. And everywhere

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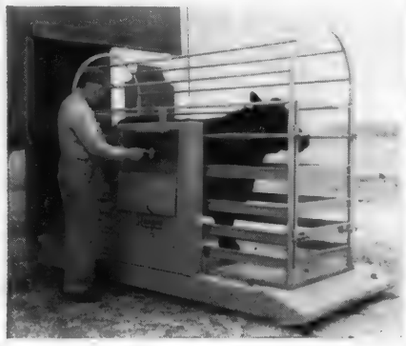

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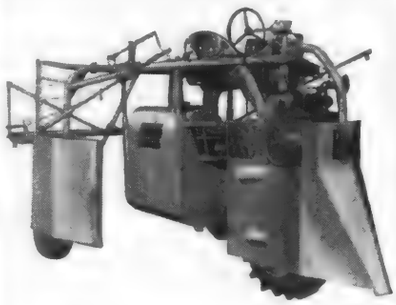

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are the aphids—the clover aphids, dock and bean aphids, and cabbage aphids; pink and green potato aphids, rose aphids, peach aphids, and corn-root aphids—a vast feast of aphids feasting, and multiplying even as they feast.

Within six days the neat and orange capsule of the lady-egg had changed completely. Inside the tough, orange shell the curious and methodical reorganizing of the cells has started from the single fertilized cell. With precision, like the forming of bubbles in a blown chain, some of the cells move outward to form the blastoderm; some move inward to make the mesoderm; and the future beetle larva is now covered with two cell layers, and separate from the sheltering shell.

Division and subdivision of the cells goes on, devouring the nutritious yolk and forming the intestines, the muscles, heart and nervous system, the glands and tracheal tubes. All the invisible, the complex functions of a living, predatory thing evolve from this marching and multiplying of one infinitesimal, life-struck cell.

And in six days, this wheeling and channeling of cells—like vast companies on a parade field magically spelling out a name—is a rapacious monster, shaped like an alligator and covered with warty spines.

The beetle larva, this small six-legged monster which looks like a series of stacked and painted doughnuts, diminishing in size, has no faceted eyes, but only a cluster of ocelli, simple eyes, on either side of its head. Each eye has only one convex lens, and so, in spite of multiple portholes on either side, the larva is confined to a small, unchanging arc of vision, like a flashlight beam, which seems to serve him well as long as even the hind claw of an aphid comes over the edge of an arc. The segments of his body are covered with hairy warts; his color is a bluish black, spotted with various pigments in various patterns, depending on his parent, but mainly of orange or pale yellow with four dark shining spots on his first two collars.

He emerges hungry from the egg and waddles briskly up the stem. Not inclined to cannibalism unless sorely starved, he ignores his waddling brothers, and, as though guided by the sound of draining sap, finds his first aphid colony and literally latches on. Although not equipped with the long powerful mandibles of the aphid-lion, his fellow predator, who punctures the aphid, impales her and sucks out the juice, casting the empty bag aside, the lady-beetle larva has adequate, sharp, little jaws. He also has a fair sense of the relative size of his meal and his strength, and he chooses the smallest aphids he can. This is not always easy since he devours fifty or more a day and so must at some time encounter being slapped in the face with a cornicle full of glue from a roused and larger aphid, but tenaciously and

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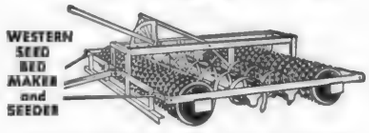

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This time the story comes from Kentucky. The narrator is J. Paxton Marshall, manager of a 350-acre cattle, sheep and hog farm near Worthington in Jefferson County. The farm is owned and operated by WAVE-TV, Louisville, on which Mr. Marshall appears in a weekly TV program. Here's what he says about his 52' x 60' Reynolds Pole Barn.

Savings—"Our pole barn with Reynolds *Lifetime* Aluminum roofing and siding was about 50% less costly to build than a conventional type barn."

Versatility—"Our pole barn takes care of cattle or sheep without alterations."

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Note what this farmer says. It all adds up to greater savings in money and man hours when you erect a low cost, labor-saving Reynolds Farm Building with *Lifetime* Aluminum. Check coupon for Reynolds Farm Building Plans at prices stated, or for free catalog describing plans available. For complete erection service write for name of nearest Reynolds Franchise Farm Builders. **Reynolds Metals Company,** Building Products Division, Louisville 1, Ky.

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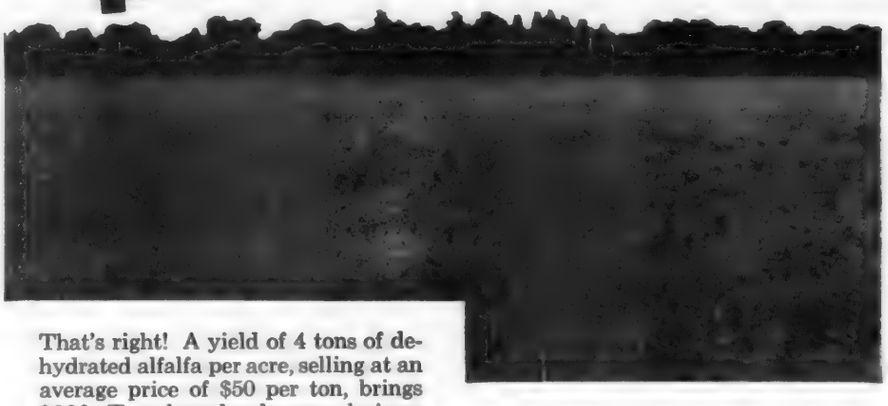

That's right! A yield of 4 tons of dehydrated alfalfa per acre, selling at an average price of $50 per ton, brings $200. Two hundred acres brings $40,000 gross income.

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blindly will continue his reckless and messy meal.

Four times in the two to three weeks of his larval life, the spotted alligator hide will become, not surprisingly, too tight. Then the larva withdraws from his banquet with a feeling of fullness, waddles listlessly off to some cleaner twig, and the next instar of his adolescent life begins. Although the adult lady-beetle will be a hundred times heavier than when it was hatched, this tremendous enlargement cannot take place gradually because of the hard shell covering in which the insect is enclosed. It must get rid of the brittle rind and bulge quickly out before the new skin hardens again, and holds it in. When the last aphid that can be crammed inside has been crammed, a molting fluid pours out under the rind, loosening and softening the tinny armor, separating it from the tender new suit beneath. Pushing and humping, the inner man emerges, expanding like a tough bubble as he comes; and suddenly a slightly bigger, not much uglier alligator lies upon the stem. The *exuviae*—old clothes—blow away, and the larva's skin begins to harden until it is completely scelerotized; and all is set again—until next week.

If the spring is late, wet and cold, the beetle larvae will grow slowly, their appetites fall off, and leave them a prey to fungous diseases, and easy victims for the small, parasitic flies that lay eggs in their living hides. But if the spring is warm and without undue rain, the larvae will eat well and become a little larger, a little hungrier, a little more useful to man, with each splitting of its skin.

As the larva nears its full growth in this stage of its life—a fullness of six to ten millimeters long—it eats with passionate attention for several days, as though cramming all nourishment it can into the alligator shape for the silent and introspective time to come. In the brief weeks of its reptilian life, it has ploughed through some 600 aphids, and its wandering mother, the lady-beetle, has laid a new batch of eggs every day or so, while eating her own long, winding meal, and these eggs have been hatching into larvae, which likewise have been devouring, so that the family eating in this one month alone is beyond imagination, and comparable only to what the aphids themselves have been up to.

The other predator of the aphid, the angular young of the lace-wing fly, the aphid-lion, is busy spinning a tiny white, silk capsule to cover the work of regeneration. But the lady-beetle larva, having nourished himself into a sluggish state, is not so particular nor even wise. Depending on the providence that has brought him well through life thus far, the lady-beetle larva finds a place on a leaf or branch and simply stops, glues his tail to the chosen spot, and proceeds to become a pupa. Some of the larvae discard their larval skin in the beginning, shrug-

ging it off and pushing it down around their tail, like a child standing in a puddle of clothes, while others retain it, partially split, and change their shape within.

By now it is late May and the second generation of lady-beetles will come into a flowering world. The apple blossoms are blowing downward, the apple aphids are sucking away at the young green apples, the rose and silver leaves of the grapes are green, and green with aphids, too. The harmful cousins of the lady-beetle, the bean and potato beetles, striped and hungry, have begun their eating and laying of eggs on the bean shoots and young potato plants, and if not sprayed will have left whole fields of pale white skeletons behind them.

In his chosen spot, glued and motionless, the lady-beetle larva begins an incredible total change. Here, in the space of five days or so, the whole structure of the insect thing is torn down, rebuilt and then re-born.

The larva no longer eats. Not even if an aphid ran blindly across its jaws as it might easily do, although it can rear up like a snake if alarmed. Its breathing slows down to the barest movement, and all its life is turned inward to the process of disintegration and reforming. Small groups of cells, the histoblasts, which have been dormant within the larval form, now grow rapidly, feeding on the dissolving larval cells and all the richness of the aphid bodies stored as fat. Once again, the miraculous and orderly marching of cells results in a complex, insect creature, now with two pairs of wings, with antennae and reproductive organs, with big compound eyes and three-jointed tarsae—a creature as different in shape and appearance as was the young

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Like thousands of other American farmers, Carol Goldsberry has found a key to easier living and bigger profits with low-cost polyethylene pipe.

A Farm Water System At One-Third Less Cost

Carol Goldsberry discovers polyethylene pipe costs ⅓ less than steel—and is so easy to install you can even do it yourself.

CAROL GOLDSBERRY of Runnells, Iowa, once hand-pumped and hand-toted 250 gallons, or 84 pailfuls, of water every day. But Goldsberry now has a complete farm water system he installed himself in one day—thanks to the low cost of pipe made from the new wonder plastic of chemistry—flexible, corrosion-proof, lightweight polyethylene.

With polyethylene pipe, Goldsberry was able to put in his water system for about one-third less cash—and make money on the deal besides. First, his one-inch polyethylene pipe cost him one-third less than one inch steel, or copper pipe.

Then, since polyethylene pipe can be purchased in 300 foot lengths (while the standard length of steel pipe is 21 feet), his time saving in couplings alone was over 1400%. And pipe made from polyethylene will swing around obstacles and turn corners —another tremendous time and money saver.

And, as Goldsberry explained to representatives of Spencer Chemical Company,* besides cutting out about four hours a day of back-breaking and foot-flattening labor, he is actually making money with his polyethylene pipe system every day.

For example, the addition of running water in his milk barn and milk house made it possible for him to be reclassified to the status of Grade A milk producer. This has doubled his income from his daily production of 40 to 60 gallons of milk. And with plenty of water, his animals get meatier on less feed, and his hens lay more eggs.

If you don't have all the running water you want, where you want it on your farm, consider economical, easy-to-install polyethylene pipe. Send coupon below for more information—without cost or obligation.

*Makers of "Poly-Eth" polyethylene.

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POLY-ETH is Spencer's symbol for polyethylene and is a registered trademark of Spencer Chemical Company.

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Please rush me more information about low-cost polyethylene pipe for farm water systems.

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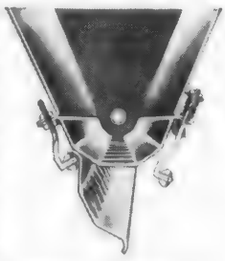

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larva that emerged from the simple yellow egg a fortnight ago. A precise image of the lady-beetle which laid the egg splits the parchment larval skin, and the second miracle has arrived on time.

About half of the lady-beetles are males, which cuts their race with the aphids down considerably. The females born of this first egg batch will begin their egg laying cycle within a week, and three or four or sometimes five generations will complete their life cycle, their vast work of eating and procreating, before the first frost has come. Thus, if it is a fortunate year of sun, the great-great-grand-daughter of that April-emerging beetle may push out the yellow dome of her egg in September—in time for an autumn meal of aphids, and then sleep. She will not lay any eggs, but eats for the winter of fasting ahead.

As the summer, which is the day of the insect world, draws down to night, there is a vast moving to and fro, nervous waves of flying and gathering, interruptions in the cold, furious pattern of eating and being eaten. The delicate daddy-long-legs weave unsteadily in and out of the fallen leaves, they gather in herds, lay their eggs and die. The brown field ants gather the eggs of the corn-root aphids, bear them gently down into their tunnels and care for them all winter.

The apple aphid, which has been self-sufficient and productive all summer, busily producing more females, winged and wingless, but females only, from her own body, feels the autumn cold, and suddenly produces wingless (and beakless) *males*. The males mate with the wingless females, and of this union comes *one* egg, carefully placed near a coming bud, to wait for spring, and the aphid dies of old age, at last. The cabbage butterflies, born of a late hatching, flutter over fields where most of the flowers have died. The mice wander houseward, and the grasshoppers, grown enormous, with great glassy wings, having riddled the earth with eggs, hunt the southern side of walls, and whir through the fields of drying corn. The jointworm sits in his dark cell in the stem of the wheat, the ground is tunneled with the hidden worms, and the bark covers small cocoons, and cocoons and chrysalides are hanging on twigs, in fallen leaves and under the rocks. Eggs, pupae, adults, all in their infinite insect forms of house and shroud. As the days chill down slowly, the convergent lady-beetles begin to feel a curious urge to gather together with their own kind. And, more mysteriously still, to find the same rock or log or cave—or even brush pile—that sheltered their ancestors in the winters of other years. Their great-great-grandmothers have died sometime during the summer and cannot return, but there is probably some lingering and acrid odor in the winter places that guides the new autumn beetles back to their old home, for they come by the thousands, and some-

time in the mountain rocks, the millions.

There, in a dark hidden hollow, under the arch of a snowbank or dome of frost-fringed leaves, they lie jumbled together, like a hidden cache of bright jewels, their legs folded under as in death, to wait for the morning of spring again.

THE AUTHOR: Josephine W. Johnson was born in Missouri and was raised on a farm there. She is the author of three novels, a volume of short stories, and a book of poetry. When she was 23 she wrote the farm novel, *"Now In November,"* which was awarded the Pulitzer Prize. Her penetrating observation and her great love of nature is a theme which runs through most of her writing, both in her fictional work and in such descriptive essays as *The Lady Bug*. In private life, Miss Johnson is the wife of Grant Cannon, FARM QUARTERLY Managing Editor.

FISH AND RICE

(*Continued from page* 73)

Even the initial clearing of land is being accomplished at a third of the usual cost of $75 per acre. Levees are thrown up, and waters turned onto rough thickets of non-commercial trees and brush for a 3-year period. Fish are stocked and grown for the market even in these cluttered waters, and what fish remain at the end of the 3-year stretch are transferred to rice ponds. In the fourth year the waters are drained off, and dead trees and brush bulldozed into stacks and burned.

Take Carp, for Example

Methods of stocking, amounts of feed and fertilizer, and management vary from farm to farm. Almost every farmer has worked out special tricks of his own. The Agricultural Experiment Station at Auburn, Alabama, has made some rather extensive studies on methods of rearing, stocking, and feeding all kinds of fish. Their report on carp is an example of how this fish, usually called a "rough" fish, can become a profit maker for the rice farmer.

The common or European carp is the

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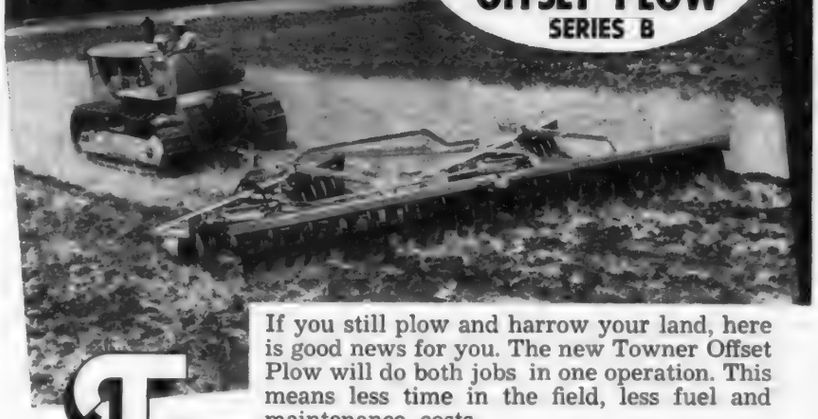

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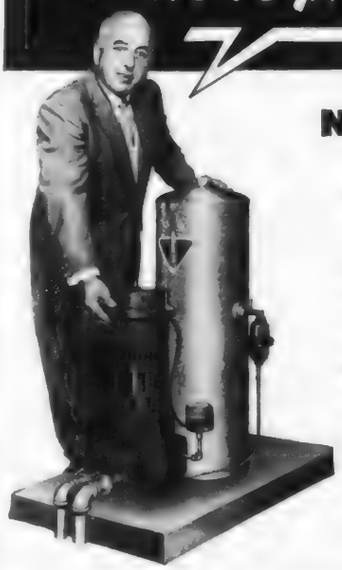

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most important commercial pond fish over the world in general. In the United States, it has limited sales at relatively low prices since it is not generally considered a desirable fish. However, when raised in ponds and well fed, its flavor compares favorably with that of other species. The presence of numerous small bones limits its usefulness in the restaurant trade.

Results of experiments on production were as follows:

Treatment	Pounds carp per acre
Fertilization with 8-8-4	280
Fertilization with cottonseed meal plus superphosphate (3-1)	435
Fertilization (8-8-4) plus feeding	700 to 1733

Inorganic fertilization with 8-8-4 gives relatively low production because carp muddy the ponds, resulting in very low phytoplankton growth. Organic fertilization using a cottonseed meal-superphosphate mixture of 3 to 1 gave higher production because the cottonseed meal tends to precipitate the suspended mud and clear the water. Highest production came with various rates of feeding combined with fertilization. Although production as high as 1,733 pounds per acre was achieved, the rates of feeding required were too high for economical production.

Because of the small bones present in the flesh, carp must be raised to sizes in excess of 2 pounds to be salable; a 5-pound size would be preferable.

Production of the 2-pound size requires that the young carp be hatched in the spring and raised to fingerling size of 3 to 5 inches by fall, when they should be stocked in the large rearing ponds. With fertilization and feeding, they will reach a 2-pound size 1 year later.

To produce a 5-pound size, the 2-pound fish must be restocked in ponds and fertilized and fed for an additional year.

Supplemental feeding of turkey growing pellets or soybean meal or cake was used to obtain 400 to 700 pounds of carp per acre at costs of 9 to 10 cents per pound. Increased rates of feeding would make possible the production of approximately 1,000 pounds carp per acre at estimated cost of 15 to 18 cents per pound. At the present time, it is doubtful that adequate profit could be obtained even at costs of 10 cents per pound.

In the Department of Ain in France, where a fish-grain rotation has been carried on for hundreds of years, the farmers have found that an acre of fish will net more profit than the same acreage in beef. The rotation is two years in fish, one year in grain, or two and one-half years in fish and one half year in grain. The principal fish is the carp. The French farmers fertilize their ponds, but do not feed the fish.

The Other Side of the Picture

While there are over two million acres in nine southern states with soils suitable for a fish-rice rotation, not every farm is

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adaptable, nor every farmer. There are problems, some of them still largely unexplored. The farmers who are succeeding are those who have imagination, are versatile, have a scientific bent, and are adventurous. Skilled management is necessary. And the conservation of water and soil is at the very heart of such management.

One of Prewitt's fields where he had grown goldfish less than 3 years showed an organic matter content of more than 3.1 per cent. That is more than 50 per cent above the comparable figure for cultivated land in Arkansas. And one of Bailey's fields had been in continuous rice production so long that the yield had slipped down to a slim 16 bushels or so. Its organic matter was very low. After 1 year of fish, this field tested a phenomenal 2.9 per cent organic matter.

The effect on crops can be very striking. Years ago Lilly had a field which used 8 acres to come up with 1 bale of cotton. Given the rice-fish treatment, this same field now grows cotton at the respectable rate of 1 bale to 1 acre.

Some acreage that had been in cotton and corn for 40 years analyzed a nitrogen content of 0.03 per cent. That's very low. By contrast, soil from Prewitt's land nearby that had been in fish production less than 3 years contained 0.16 per cent nitrogen. And that's very high for the area. The analysis of nitrogen content can be very tricky because of the fact that nitrogen content is not constant throughout the year, but this fact would hardly account for such conspicuous improvement.

Water is a problem common to all but it is met in divergent ways. Lilly owns seven lakes, all connected and each with an opening on one side to admit runoff water from a drainage area. He depends on rainwater altogether.

Other farmers have ponds that are closed on all sides; they are filled with rain in the fall and winter.

Nearly all the establishments utilize supplemental sources of water, both surface and underground. You'll find them pumping from bayou or wells, as needed. It takes a good many gallons to take care of evaporation alone, particularly in summer. Bailey pumps from late spring to early fall, and it takes 2,000 gallons a minute merely to offset evaporation and seepage in his 14 fish ponds.

As more and more water is removed from underground storage, the water table tends to lower. But these farmers are intelligent and conscientious. They are aware of their conservation requirements. When they drain a pond or a rice field, they transfer the water to another pond or field. Nixon's system links his whole chain of basins for efficient distribution. One of the schemes under consideration by some of these farmers involves the possible recharging of underground reservoirs by a series of deep wells which will operate in reverse. *(Continued to next page)*

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It's not always rice that enters the rotation. Prewitt, for example, isn't set up for rice because of the size and arrangement of his ponds. Instead, he engages in beef production—corn and Sudan grass for silage, followed by fish. To illustrate the extreme versatility of this style of farming, it should be noted that in some of Nixon's fields rice and fish are even produced simultaneously! He stocks his rice field with fish at time of flooding. On draining the field, he removes the fish to another pool. In one 8-acre field he not only harvested a fine crop of fish but also gathered in 1,000 bushels of rice.

This extraordinary group of freewheeling nonconformists, Prewitt, Nixon, Bailey, and Lilly, have ideas. They are successful blenders of science and practice.

THE AUTHOR: After more than 20 years with the SCS, Wellington Brink has been transferred to the International Cooperation Administration in Thailand as an advisor to the government on agricultural extension services. Mr. Brink founded and published the magazine *Soil Conservation* and developed it into one of the best known soil magazines in the country. He is the author of the well-known book, "Big Hugh—the Father of Soil Conservation," a biography of Hugh Bennett. A graduate of Kansas State College, he was for a time editor of *Farm and Ranch* and on the editorial staff of a number of trade journals.

SELLING FOR THE TOP DOLLAR

(*Continued from page* 71)

Armour and Company's general offices in Chicago. According to Shay, anyone intending to feed for markets in the upper New England States would do well to forget the medium weight cattle just mentioned. "They want big, weighty cattle down east," he says, "carcasses that weigh six hundred pounds and up dressed. They like steers with a thin bark of fat.

"In metropolitan New York with its tremendous population, there is a market for almost any kind of beef, but six hundred to seven hundred pound steer carcasses are the most popular and there is a ready outlet for Prime beef, too. The Prime moves to the hotels and better restaurants and night spots, to the luxury liners and the dining cars.

"Consumers in Virginia, Tennessee and Kentucky like lightweight steers. We ship them four hundred to five hundred pound carcasses for distributive outlets, five hundred pound Choice carcasses for chains.

"The Ohio market is outstanding in its preference for light heifers. Heifers that will finish nicely at seven hundred and fifty pounds and less have a good demand in the independent stores. The chains like middleweight Choice steer carcasses."

And so it goes the country over. The farmer who finishes his cattle to the preference of his market is always in a much better position than the man who comes in with a bunch fed to his personal taste.

Estimates of Supply

What channels of information can the feeder depend upon for information as to probable supplies and runs? Unfortunately, many of the "experts" are asking this same question. Unfortunately, also, if any great number of farmers read and interpret in similar fashion the same statistics they may find they are letting themselves in for trouble. A classic example of this was the situation last fall. The July 1 quarterly report of "Cattle on Feed" showed large numbers of heavy cattle ready to hit the markets in late summer. Apparently many of the holders of these cattle became aware of the figures and all of them arrived at the same conclusion, that the smart move was not to move at all but to hold till later in the fall. The result was the situation outlined at the beginning of this article.

Personal contact with the feeder's closest market is his best crutch. There is the case of the Nebraska feeder who generally sells his Prime cattle at Chicago. He never hesitates to run up a $10 phone bill to call his commissionman for a detailed rundown on current prices and market conditions when he has a load about ready to ship. He will not only get the last word on prices, but advice on

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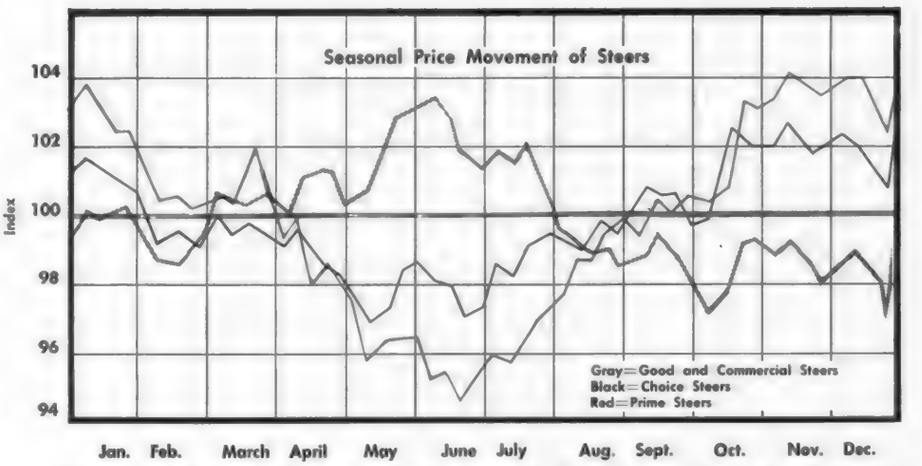
exactly what the packers happen to be looking for, the market man's estimate of the immediate market supply, an estimate developed through his personal contacts, those near at hand as well as those reached by long distance phone, possibly a warning about an up-coming holiday that may have its effect on buyers' intentions.

The effects of a holiday, when a plant is to be shut down or packing house workers must be paid triple time, are usually felt from a few days to a week ahead. A farmer caught in a heavy run at such a time might be in for an unpleasant experience. At Thanksgiving and Christmas, particularly, poultry consumption is heavy and demand for beef light. Consequently, cattle prices tend to weaken if supplies are too heavy a week to ten days before the holiday. While a feeder should never be encouraged to try to wait out an extended period of market uncertainty, he can always hold off a few days or a week without his cattle losing their bloom.

The chart on this page shows the annual average price trends for Prime, Choice and Good and Commercial steers over the years. But market men advise that even these should be taken with a good, strong pinch of salt since they "average out" this way for years, but one or two exceptional years may be way off. The strengthening prices indicated for Prime and Choice steers during the late summer and fall simply failed to develop last year.



This chart is based on the index of prices for each of the four grades of slaughter steers at Chicago for the years 1935-52. It shows only the RELATIVE price fluctuations WITHIN each grade and should not be used to make a comparison BETWEEN grades. For example, it shows that Prime cattle usually reach their lows in June; that Good and Choice reach their peak in summer. It does not indicate that Good and Choice steers actually bring more money than Prime cattle in June.

Profit Margins

After prices slipped last fall many farmers were forced to adopt the attitude of Ralph Boals. Boals annually puts 3000 to 4000 head of cattle through his lots in northeast Nebraska, selling them at a Choice grade. When the squeeze in on his advice is, "Sell whenever you have a profit margin. Don't wait till they're finished.

"I usually lay in cattle to full feed from a hundred and twenty to a hundred and eighty days," he says, "but when prices are down I start topping them out in about ninety days regardless of finish and I try to buy replacements at a lower price to even up."

Capitalizing on margin requires that a feeder be able to make a reliable estimate of the amount of gain necessary to develop a bunch of feeder cattle into acceptable market animals. This means he must not only be able to estimate the

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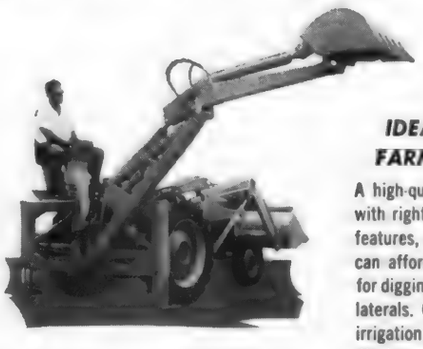

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amount of feed needed, but must add to this an allowance for risk, interest, overhead and marketing costs. Fifteen per cent of feed costs used to be the accepted rule of thumb to cover the latter items. Today, 20 per cent seems a more realistic figure. The table below, developed by the Iowa Experiment Station, is handy for making a quick determination of the price a steer or heifer must bring to break even.

FEED COSTS AT DIFFERENT STAGES IN THE FATTENING PROCESS OF GOOD AND CHOICE STEERS IN DRY LOT

Corn calculated at $1.10 in first column; $1.50 in second column.

	400-lb. Calf		640-lb. Yearling		840-lb. 2-year-old	
	Corn		Corn		Corn	
Gain	$1.10	$1.50	$1.10	$1.50	$1.10	$1.50
1st 100 lbs.	$9.57	$13.05	$11.55	$15.75	$11.77	$16.05
2nd 100 lbs.	$10.67	$14.55	$13.53	$18.45	$14.41	$19.65
3rd 100 lbs.	$11.99	$16.35	$15.73	$21.45	$18.48	$25.20
4th 100 lbs.	$13.64	$18.60	$19.25	$26.25	$25.74	$35.10
5th 100 lbs.	$17.16	$23.40	$24.64	$33.60	($17.93)*	($24.45)*
6th 100 lbs.	$19.14	$26.10				
7th 100 lbs.	$24.09	$32.85				

* For 50 lbs. gain

For example, a 400 pound calf bought at 20 cents and fed on $1.50 corn until it weighed 900 pounds would represent a total investment to the feeder of $183.14 ($80 original cost plus a feed cost of $85.95, the total of the first five units in the second column of the table, plus 20 per cent of the feed costs, or $17.19, representing the overhead costs). The break-even price would be $20.34.

To put another 100 pounds on the steer would cost $26.10 and with the additional overhead cost would bring the total to $214.45, making it necessary to get a price of $21.45. This is the break-even price at the farm. To it must be added shipping and selling expenses, possibly another 40 to 50 cents a hundred.

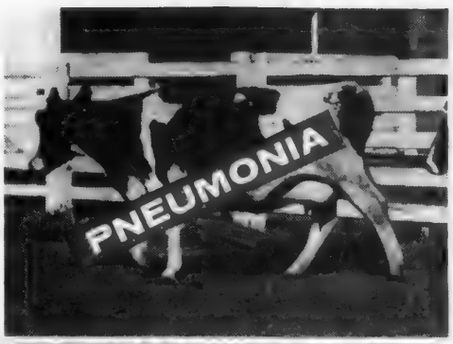
Direct Selling

There is a large body of farmers who prefer to sell their cattle to a trader or packer buyer at the farm rather than consign them to a terminal market. This preference seems to be motivated by the old bird in the hand psychology, the feeling that 19 cents cash in hand at the farm is worth more than a chance to get 20 cents or 20½ cents at the stock yard. It may be that at times a farmer does come out on the long end in one of those direct deals. It is perfectly safe to say, though, that in the majority of cases, he does no better than if he had shipped to the yard, frequently not as well. Look at a few specific cases.

There's Joe Smith who likes to sell direct to the packer buyer who comes to his farm. Joe takes a quick look at the market reports in the paper, bends an ear to the noon-hour reports on the radio and thinks he's right up to snuff on values. Then he pits his trading ability against a man—and this is no reflection on the integrity of the buyer—who makes more deals in a day than Joe does in a year. Maybe this buyer's plant lacks a good outlet for Joe's kind of cattle and can use them only at a discount. Joe's alternatives are to take the bid or wait for another buyer to drop in, hoping this new one will have a higher opinion of his cattle.

Then there's George Jones who always sells to John Brown, a speculator. "I save commission, yardage and trucking," he argues, "so I figure I can let them go maybe a dollar a hundred cheaper if I have to." But what are the facts? George lives within 35 miles of a terminal market where the commission and yardage on a 1000 pound steer wouldn't run more than $2; that's a maximum of 20 cents a hundred. His trucking wouldn't cost more than another 25 to 30 cents a hundred. That makes total trucking, commission and yardage, 45 to 50 cents.

Brown invariably pulls into the Jones barnyard with his semi-trailer around 4 o'clock in the morning—"Sorry to get you out so early, George, but we've got a couple of other loads to pick up before the scales open"—gets the cattle loaded completely



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empty, keeps them off feed and water till they go to the scales. After they have been weighed they go back to a pen, get a little hay and water and are resold. Thousand pound cattle can put on 25 pounds mighty fast when they drink a lot of water. At 20 cents a pound this puts $5 a head on the bunch. And Jones thinks he's smart to "give or take a buck to save commission."

This brings up the importance of shrink and fill in marketing cattle. Fill is the feed and water animals carry in their stomachs and intestines. Well finished cattle cannot handle as much fill as thinner stock because their organs take on fat and there is less room for fill. Nevertheless, when buyers make a deal for cattle at the farm they usually try to protect themselves against paying for a lot of feed and water. In many areas the cattle are bought subject to a 3 to 5 per cent shrink. In others it is common practice to require that they be delivered to the yard or to the packer by 9 p.m. where they are held off feed and water until after their trip to the scales at 8 the next morning. Cattle which arrive at a terminal market carrying an obvious fill are by-passed by the buyers until they have had a chance to settle down. Sometimes this may penalize the seller a full day.

One Ball of Wax

Briefly, here are the guideposts to good marketing:

a) Acquire as much personal contact with the market as possible; use your closest terminal market or the market of your preference as a tool the same as you use your tractor or combine.

b) Develop knowledge of grades and finish through occasional visits to the yards.

c) Never try to wait out a falling market. When prices are down have the courage to take your losses and get back in the game with cheaper cattle.

d) Find what kind of beef—grade, weight and sex—is preferred on your market and make that your goal.

e) Learn to calculate your profit margins and use them as a guide to selling.

f) When selling direct remember that you are an inexperienced seller dealing with a thoroughly experienced buyer. Don't let your desire to save selling and shipping costs cloud your judgment.

g) Don't think you can fool the experienced buyer with cattle carrying a lot of fill.

h) And this one is so rudimentary it wasn't even mentioned in the article—never buy or sell cattle by the head; always have them weighed.

ROLL-OVER TERRACES

(*Continued from page* 85)

peak runoff from a terraced field is less than half that from the same field when unterraced.

For waterways to serve flat terraces, it has been found that small ones with a depth of 12 to 18 inches will do a good job. These are built so that they have a side slope of 10 to 1—or they may be even flatter.

How to Lay Out Terraces

Field judgment, gained by experience, and the skills needed to use a farm level, are necessary to qualify a person to stake terraces in a field. The first step is to determine the slope of the land from the crest of the hill down to the probable location of the top terrace. You'll need a rod marked off in feet and the farm level to do this job. Set up the level at the crest and measure downhill for 100 feet. Have your rodman set up the rod at this point and read off the drop in elevation. If, for instance, it is 4 feet, you have a 4 per cent slope. Make several readings around the hill to get an average slope with which you can work. Using this figure, apply this rule for vertical intervals; the distance be-

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tween terraces equals $\frac{\%\ slope\ of\ land + 3.}{2}$

The figure that this equation gives is the vertical interval between terraces in feet.

For example, if your slope is 5 per cent, the formula will read:

$$\frac{5 + 3}{2} = 4 \text{ ft. vertical interval}$$

On a 5 per cent slope we have 5 feet vertical interval every 100 feet, or 1 foot every 20 feet. Therefore, to obtain a 4 foot vertical interval it would require spacing the terrace 80 feet from the top of the hill.

Spot your rodman on the location of the top terrace as much below the elevation of the crest of the hill as required by the answer above. Then set stakes at points along the line of the terrace as needed, generally 50 feet apart, allowing the proper fall, 6 inches or less per 100 feet toward the outlet end. To locate the second terrace, obtain the field slope below the top terrace and proceed as above.

Practically all counties in which terracing is being done are in Soil Conservation Districts. Technicians of the Soil Conservation Service who are servicing these districts have training and experience in layout out and building terraces. They are glad to help farmers with terracing layout and design.

(Continued to next page)

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Terraces can be built with plows of any kind; this big 5-disk size Deere Tiller cuts the time

cast uphill or downhill. From the standpoint of correcting erosion, it is better to turn the furrows uphill. Terraces will hold soil fertility as well as moisture, and because these are the lifeblood of any crop a terracing program will increase yields and maintain soil fertility.

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Photo courtesy Massey-Harris-Ferguson
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POULTRY YARD

(*Continued from page* 24)

market for the 3,000 birds that Weidner raises on his 60-acre farm. This outlet only illustrates the thought that Weidner and his wife have given to marketing. Ads in local papers and word-of-mouth advertising from satisfied customers sell around a thousand birds right on the farm. The rest go into the Thanksgiving and Christmas trade. A new angle on Christmas selling is to gift-wrap the birds in bright cellophane bags. The Weidners say that several companies have found an attractively wrapped turkey the ideal gift for their employees. "You'd be surprised, too, at how many people find a nicely wrapped turkey just the thing to give their pastor," Mrs. Weidner says.

A. B. Kennerly

Check-List For Chicks Chicks that get off to a good start develop into vigorous, economical birds that make a profit. Every poultryman who does a good job of raising chicks has a check-list of things to be done (either in his mind or written out on paper). Here are some items that should be on the list. (1) Plan to have all the preparation work done two days before the chicks arrive—floors scraped and scrubbed with lye water (13 ounces of lye to 10 gallons of water), walls and brooders cleaned, brooders checked for even heat (95 degrees F. two inches above the floor at the edge of the brooder), ventilation system working, floor covered with bedding and a layer of paper over it to prevent the chicks from eating it until they learn the difference between bed and board. (2) Put out the water jars (a one gallon fount for each 100 birds) so that the water will warm to room temperature before the chicks arrive. (3) For their first two days, feed fine chick scratch with a little chick grit mixed in—scratch digests more slowly and gives the chicks a chance to absorb the remains of the yolk. Don't feed the grit free-choice until they are a couple of weeks old or they may fill up on it, packing the gizzard. (4) After the birds are two days old, start feeding a good starting mash. Fill the hoppers half full and allow an inch of hopper space for each chick at the start. Place the hoppers at right angles to the brooders at the start and move them farther away as the chicks grow. (5) Check with your veterinarian to work out a program of inoculation for the flock. Also discuss with him the need for medicated feed. (6) Lower the brooder temperature approximately five degrees a week.

DAIRY BARN

(*Continued from page* 22)

into a leasing arrangement of this type with their producers rather than go to the expense of extensive remodeling. On the other hand, if they have rather recently made large investments in receiving and processing equipment there will be little incentive for their tying up more capital in a battery of bulk tanks.

Situations will differ, of course, as between handlers and from one dairy region to another, but this plan looks like a tool which may be available to a good many dairymen to help them pass into the bulk era with a minimum of growing pains.

Silage Feeding Schedules The recommendation often is made to Grade A milk producers that silage should be fed after milking. George Werner, dairy cattle specialist, University of Wisconsin, says this doesn't have to upset the chore routine in the dairy barn. He offers several suggestions for handling silage feeding.

Where the cows get a heavy feed of all grass silage and very little hay, half the silage—enough to last until noon—can be given right after the morning milking. Then all the hay can be fed at noon and the rest of the silage can be given after the evening milking. This evening feeding can be enough to last till midnight or later. With this kind of a schedule the cows will have finished up their silage at least five hours before each milk-

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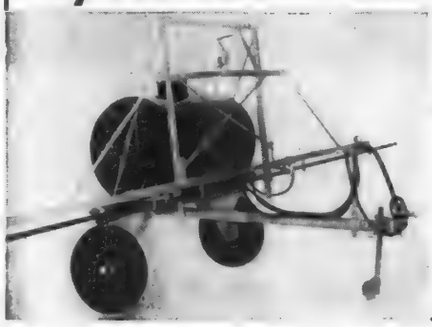

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A fine looking herd! But one swift outbreak of cholera could wipe them out, and the year's hog profits, too.

Don't let this happen to your herd. Have them vaccinated and be safe. Remember, cholera can break out when least expected, even among the healthiest-looking pigs. Once it strikes, there is no cure. Vaccination is the only safeguard.

And, be sure to have the vaccinating done by a veterinarian. When dealing with a killer like cholera, don't gamble with amateur methods. Your veterinarian knows just WHEN to vaccinate. He can best decide which is the right TYPE of vaccination. And he knows how to do it RIGHT. Call your veterinarian, have every pig vaccinated, and KNOW you're safe.

This message in the public interest sponsored by American Foundation for Animal Health

ing and there will be little danger of silage odors in the milk.

If the herd is on half grass silage and half corn silage, the same schedule can be used feeding the corn silage in the morning and the grass silage after the night milking.

On farms where only corn silage is fed it can be given to the cows in one feeding, preferably the morning one, Warner advises. This won't work with grass silage, however, because the cows do not eat the grass as fast as the corn.

Feeding all the hay in the afternoon has an advantage in that the dairyman can be around to keep it pushed up to the cows that are in the habit of shoving it away.

Farmers who have hesitated to adopt a heavy roughage feeding program because of the bad effect it might have on milk quality may find one of these schedules the solution to their problem.

Low-Brow Feed Wood molasses is one of the latest low-brow materials to make the grade as an important feedstuff, according to the North Carolina Experiment Station at Raleigh.

In a series of trials, wood molasses was fed to lactating dairy cows in amounts up to 6 pounds a day to test the effect of the molasses upon milk production and general health. It was found that a pound of molasses was worth at least a half pound of grain at all levels fed.

The cows didn't seem to like the wood molasses as well as they liked cane molasses. But even when it was fed as long as 112 days no serious effects were noted.

The molasses was produced from mixed hardwoods by sulfuric acid hydrolosis. In the trials it was mixed into the concentrate replacing either corn or milo maize pound for pound at levels of 10 and 20 per cent for 28 days. In the 112-day trial mentioned, it was fed in amounts of 4 and 6 pounds per cow daily. In this trial it was poured over corn silage which, with good alfalfa hay, made up the roughage in the ration.

OVER THE BACK FENCE

(*Continued from page* 26)

bushel measure for the more convenient hundred weight in buying, selling, and measuring grain, and in tabulating acre yields.

Someday some statistician will figure up how many million dollars are lost each year, and how many miles of pencil are consumed in translating bushels into pounds and back again as farmers and dealers buy and sell grain.

The farmer often comes out short on this transaction. A bushel of wheat, for example, may range from 57 to 63 pounds, depending on moisture content. A farmer who sells 57 pound wheat by the bushel stands to lose 3 pounds unless he has a sharp pencil. Furthermore, it is rather confusing to compare the feed value of 70

cents per bushel oats with $1.30 per bushel corn, when on a hundredweight basis it would be $2.19 for oats and $2.32 for corn.

But, so ingrained is the bushel habit here in America, it would probably take a dictator to make the change. That is just what Napoleon did 150 years ago when he switched France to the metric system.

The Hungry Weed One hungry pigweed in a hill of corn may cut yield by 30 percent. Ragweed takes three times as much water as corn. A common mustard plant takes twice as much nitrogen and phosphorus and four times as much water as one oat plant.

For Whom The Bell Tolls Somebody's got to do something about mules. We reached this conclusion recently when we were informed that there were not more than 25 jacks in the whole state of Missouri and only 50 in the whole U. S. A. (A jack, for the information of those unacquainted with the genetics of mules, is a mule's papa.) Missouri used to be the mule center of the world and at one time there was a jack kicking the sides out of barns in every village and hamlet. One wonders what's to become of us if the mule becomes extinct, like the dodo. Something fine will disappear from the American scene, for a plow with a mule at one end and a man at the other made this country. At least this combination added interest and color to the rural landscape and made our American idioms expressive and forceful. The fine art of cussing will die with the mule.

When the old mule wears out, people in the south, his last stronghold, now buy cub tractors. They say a tractor eats only when it works. That may be true, but

(*Continued on page* 180)

Does your water run slow?

BURKS PUMPS

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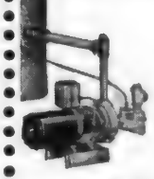

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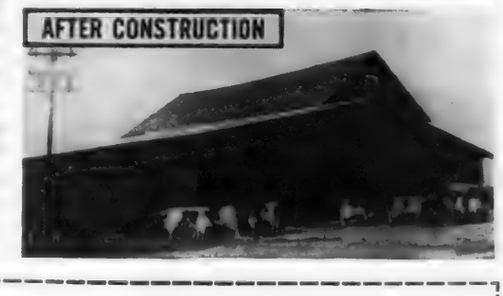
Howard M. Call and son, Charles, owners and operators of a well-known dairy farm in Darrowville, Ohio. By using Koppers Poles like the one shown here, this father-and-son team, plus one hired helper, built a large addition to their barn in three weeks' time. And the work was done while keeping up with daily farm chores.



TODAY'S HOLSTEINS are heavier and bigger than those of some years ago. They require far more room. This fact was forcibly driven home to Howard M. Call and his son, Charles, owners and operators of a 180-acre dairy farm at Darrowville, Ohio. Their old barn, built in 1912, was "bulging at the seams."

Therefore, the Calls decided to build a 4,050 square-foot addition—a loafing barn. By using the pole-type method of construction, the father-and-son team, plus one hired helper, erected the new structure in three weeks' time. And it was built for only $2700—about one-third the cost of a conventional barn of the same size.

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KINDNESS PAYS IN MANY WAYS

(*Continued from page* 93)

Every artificial insemination association knows that cows handled by new technicians have lower conception rates than those inseminated by more experienced men. One explanation for this is that it takes a new man a little time to develop the technique. But technique means more than just the proper placement of the semen. It also means getting over

Nancy Turner hugs steer, busses Judge Weber.

his own nervousness and tenseness, learning to do the job without awkwardness or roughness, developing an easy, quiet approach.

These facts were clearly shown in a series of experiments by Dr. N. L. Van Demark and Dr. R. L. Hays, of the University of Illinois. These two scientists found that, contrary to popular belief, the semen was transported from the opening of the uterus up the horn of the uterus to the egg by rhythmic contractions of the uterus rather than by the movement of the sperm itself. They reached this conclusion after checking the time it took the sperm to reach the egg; the sperm got there much faster than it could possibly have made it under its own power and, furthermore, dead sperm reached the egg just as rapidly as live, motile sperm.

They then investigated the causes of these contractions and found that they occurred in a cow in heat under three conditions, (1) when a bull was permitted to mount, (2) when she was inseminated artificially, and (3) when she was given an injection of oxytocin. They also found that the contractions were diminished or stopped entirely when the cow was frightened or when she was given an injection of epinephrine.

To make their case clearer, they removed the uteri of several cows immediately after slaughter and kept these organs alive in a simulated blood solution. They then added oxytocin to the solution and found that the uterus went through the same series of contractions and that these could be stopped by adding epinephrine to the solution. If the fear hormone was given first, the action of

the oxytocin was prevented.

These scientists concluded that the gentle handling of cows and probably other animals just before breeding would materially improve conception rates. Applying their findings to other animals is not just a guess. Similar results to those achieved by Van Demark and Hays have been noted in several experiments on laboratory animals such as rabbits and rats.

They might also have found support for their conclusion in studies in human conception. One example, which has been repeated so often as to become a common occurrence, is that of the couple who wanted desperately to have children, but seemed unable to produce. After they had given up hope, they adopted a child and their tensions disappeared. Shortly thereafter, the wife was knitting little sweaters for one of their own.

Another example of the effect of frustration and cruelty on conception rate in humans is the case of the Grand Chaco Indians of South America who were permitted time and again to clear land and begin farming only to be driven off it by the Spanish population. After some fifty years of such treatment, the birthrate of the tribe dropped to zero and they have become extinct.

Male Sterility

The ability of the male animal to produce sperm is also affected by the way he is handled. The Jersey bull which became sterile is an example of this, but there are many others. Young boars which have been picked on by older, stronger hogs often lose their power to inseminate a sow. Dr. A. V. Nalbandov, a geneticist, has noted that when he uses a boar over a period of time as a teaser in order to find out if the sows are in heat (a situation which any male would find frustrating), the animal invariably becomes sterile. Male rabbits react in exactly the same way. In one case, he made careful measurements of the testes of a rabbit before starting to use him as a teaser and after three months use when the rabbit had become sterile. He found that the testes and the rest of the reproductive apparatus had shrunk to almost half its original size.

In checking the effect of the fear hormone on bulls, Dr. Van Demark has found that injecting these animals with small

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amounts of epinephrine for a period of time reduced their production of motile sperm to as low as 25 per cent of that of his control group. After the treatment was stopped, they regained their ability to produce sperm.

Don't Bother the Hens

Mammals are not the only creatures whose reproductive life is disturbed by mistreatment. Poultrymen have known for a long time that their laying hens were easily disturbed by sudden noise or action. The practice of knocking on the henhouse door to warn the chickens that the door would be opened was found to keep them calm. Originally, it was thought that their sudden hysterical flights caused blood spots. These are now known to be an hereditary factor. One curious poultryman decided to test this out for himself and turned his terrier in with the flock to stir them up once a day. Egg production fell to almost nothing, but the percentage of blood spotted eggs remained stable.

Frightening turkeys is not just a matter of egg production or throwing them off their feed; it can affect their very lives. A good example of this is told by Robert Groesbeck: "I wanted a picture of my flock, so I asked a photographer out to shoot one. The birds milled around quite a bit and I had to get him to stand real quiet for a time to get them settled down. When he finally took his picture and the flash bulbs went off, there was a terrible startled gabbling and three of the birds dropped dead of fright."

Growth and Endurance

Cattle and lamb feeders, like poultrymen, have learned that when their animals are disturbed they go off their feed and meat production drops. Dogs that chase the animals are taboo and visitors who disturb them while they are eating or quietly chewing their cud are not welcome.

A Texas rancher has carried this philosophy of gentle treatment to the range. His idea is that the necessary pain of branding and castrating will be the only unpleasant experience his cattle will have. The rest of the time he sees to it that they have the advantage over his ranch hands by giving the cowboys poor horses. "One man asked me how it was that we had such good looking cattle and such sorry looking horses," he said. "I told him that that is the whole answer to good looking cattle. When you put a cowboy on a good horse, it's a contest between him and the cattle. When he's on a sorry horse, he has to use his head."

An example of using his head to round up cattle was the time he gathered up a herd of 300 yearling heifers out of 1000 acres of rough range. He simply took a cow and a calf into the field, tied the calf to a stake and let it bawl; then he led the cow all around the fence line, bawling for her calf. By the time they got back to the calf, every heifer in the field was following them.

An interesting confirmation of emotional upset on growth was made by Dr. T. W. Todd, an anatomist at Western Reserve University, who discovered a method of telling the age of human bones by studying the ossification centers. It was he who determined the age at the time of death of King Tutankhamen. In this work he found that growth was retarded by illness and infection, which was not surprising. What did startle the scientific world was his discovery that the growth of children from broken homes was stunted during the period of break-up and did not resume until they had become emotionally adjusted to their new situation.

Experimental work with the fear hormone, epinephrine, on laboratory animals has shown that not only is their growth slowed by this chemical, their rate of feed conversion is also affected. The gently treated animals which were not given epinephrine made substantially faster gains and did it on less feed per pound gained.

One of the most far reaching experiments in this field was done without drugs and without mistreatment. Here kindness alone was the experimental tool. The test was between animals which were normally treated and those which were given extra attention, called "gentling" by the experimenters.

In this experiment Dr. Otto Weininger, a psychologist at the University of Toronto, Canada, used 32 white rats divided into

two equal groups. All of the rats were individually housed and self-fed and watered. All were 23 days of age when the experiment started. Half of the rats were left in their comfortable cages all the time; the other 16 were taken out of their cages once each day and petted for ten minutes. This petting procedure lasted for three weeks, after that both groups were left in their cages. At the end of the three weeks the petted rats weighed 161 grams, the control group averaged 141 grams and at the end of 79 days, after five weeks of being treated exactly the same, the petted group weighed 319 grams while the control group weighed only 264 grams.

The second part of this experiment was even more startling. At 79 days of age, each of the rats was immobilized on its back and deprived of food and water for two days. At the end of this ordeal, all of the rats were killed and were then examined by a second scientist who did not know which rats were in the control group and which had been the petted rats. This post-mortem examination showed that 12 of the 16 rats in the control group had suffered heart damage including distension of surface blood vessels, while only five of the petted group had suffered heart injury during the stress period. The control group developed 54 bleeding points in the stomach and duodenum caused by their ordeal while the

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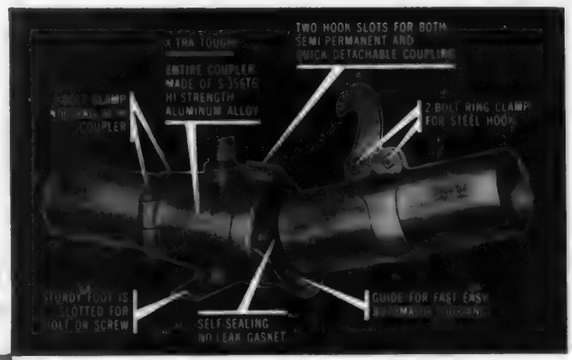
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petted group showed only 9 such points. (In humans, these bleeding points might well be the biginnings of an ulcer.) And finally, the control group had significantly heavier adrenals, the glands which secrete the fear hormone, epinephrine. In other words, being petted for 10 minutes a day for three weeks turned half of these animals into fast growing individuals which were able to withstand unusual stress without serious damage as compared to the other half which were raised under exactly the same conditions except for the large dose of affection.

Anyone who is interested in farming for profit should be able to draw his own conclusions from these experiments. There is, however, one other point that he should remember. That is, the fun of working with animals. Affection, after all, is a two-way street. The animals that you love will love you; and the love of an animal, whether it's your tail-wagging dog or your gristle-nosed brood sow, can be very comforting. It may even save you an ulcer or a heart attack.

THE FARM'S PICTURES

Cover by Grant Heilman

Grant Heilman, who made the Kodachrome for our Spring cover, lives in Lititz, Pennsylvania. The picture of the bee was taken on the D. M. Stauffer fruit farm near Lititz. He says: "I was taking pictures of fruit blossoms last May when the bee momentarily alighted. I had to move my heavy equipment in closer to get the extreme closeup and with a bee you can't say, 'Will you do that again, please?' I snapped the shutter just as he was about to take off."

Photographers and Artists represented:

46—Kosti Ruohomaa from Black Star. 48—J. C. Allen & Son. 49—Chart by Fred Eichenberger. 51—Robert B. Goodman. 52—Joe Munroe. 53—Fred Knoop. 54 and 55—Courtesy of Farmers' Museum. 56—James Fox. 57—Fred Knoop. 58—Grant Heilman. 59 thru 61—Fred Knoop. 62 thru 65—Glenn R. Vernam. 66—Vapor Blast Mfg. Co.; Finco, Inc.; Lakeshore Mfg. Co.; Hartzell Propellor Fan Co. 67—Behlen Mfg. Co. 68—Chuck Abbott, Rapho-Guillumette. 69 thru 71—Robert B. Goodman. 72 and 73—Edgar A. Hodson. 74—Joe Munroe. 75 and 76—Chas. R. Koch. 77—Grant Heilman. 78—Dr. K. S. Hagen, Univ. of Calif. 79—Drawing by Stan Brod. 80 and 81—Cliff Shreffler. 82 and 83—Oscillogram and chart by A. J. Wojta, Univ. of Wisc. 82—Fred Knoop. 83—Fred Knoop; Tumaco Equipment; Joe Munroe. 84—Fred Knoop; Carl Mansfield. 85—Chart by W. P. Lamb. 86—Fred Knoop. 87—George Laycock. 88—Grant Heilman. 89 thru 92—Joe Munroe. 93—W. D. Munro; Cy LaTour. 98—Glenn R. Vernam. 106—Mrs. C. S. Whisnant. 129—Chart by Fred Eichenberger. 130—Table, Iowa State College. 134—Deere & Co. 138—J. F. Abernathy Live Stock Photo Co. 143 and 144—Fred Knoop. 163—Donald K. O'Brien. 167—Minneapolis-Moline Co. 177—Fred Knoop. 181—Grant G. Cannon.

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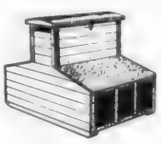

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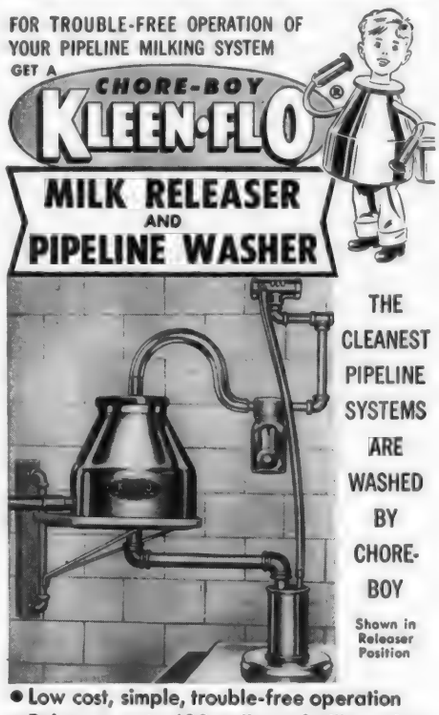

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C. I. P.

(*Continued from page* 53)

essentially is a big stainless steel or glass pail that is hung above the pipeline at the opposite end from the wash sink. When it fills to the top the vacuum seal is broken and the solution flows by gravity back through the line. This reversing flow continues as long as needed. A reversing valve worked by a time switch can also be used to do this same job and its cost is about the same. When the vacuum system is used on a loop or double pipeline to do the washing job, the cleaning solutions are picked up out of the wash-up sink, circulated through the milking machine, teat cups, through the line and then dumped back in the sink. This action is continued as long as needed for each part of the cycle. With either the pressure system or the vacuum system, the U. S. Public Health Service recommendations are that the solution must flow through the line at not less than five feet per second. With the De Laval "In-Place" Vacuum System the solutions pick up terrific speed through the introduction of air, with accompanying turbulence in wash water. The important point to remember is that any pipeline that is to be cleaned-in-place, must be designed, built and installed for C. I. P. cleaning.

How You Do It

After the milk has been safely dropped either into cans or a bulk tank, the actual clean-up procedure consists of these steps and will take about 40 minutes: First comes a rinse in lukewarm water to remove all the milk from the pipeline. Water is drawn through the milk valve into the line and the rinsing continues until the water runs clear, usually in about 5 minutes.

Woody Conner and his wife do the milking together on their dairy farm near Cambridge City, Indiana. This sink is part of their C.I.P. set-up, which works by vacuum.

After the rinse water is drained and discarded, the teat cups can then be mounted on a manifold at the sink for the rest of the washing operation. Then the detergent in hot water (160 degrees) is circulated through the line for 15 to 20 minutes. It is at this point that Bill Whitton, Head Dairy Inspector for the Los Angeles County Board of Health, says, "We tell 'em to go in and eat breakfast while the detergent is circulating, then we *know* it will be in the line long enough." This detergent water is drained. Then a lukewarm (110 degrees) clear water rinse is run through the line for 5 minutes. A chlorine rinse (200 ppm) is used directly before milking. That's all there is to it.

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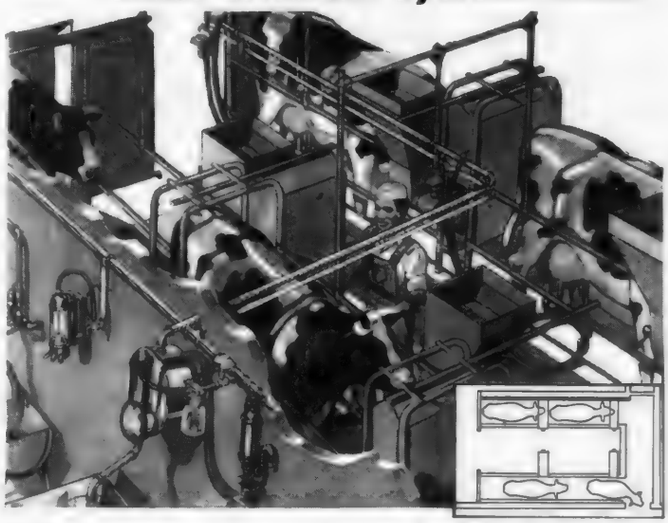
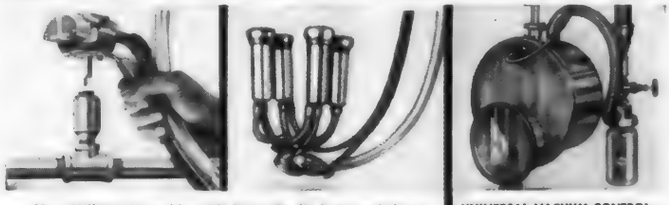


"Going Supermatic" with UNIVERSAL Walk-Thru is your surest road to easier milking. You get better quality milk, greater production yet "gentler" milking, and best of all you're out of the barn in much less time. You're free from all heavy lifting, carrying, filtering. Easy, convenient handling of the teat cup assembly from cow to cow — without stooping or squatting. Prepare two cows while other two are milking. Minimum space requirement — minimum cleaning, faster cow travel. Universal Supermatic Milking is the answer to increased production — better milk quality and easier, faster milking with reduced labor cost.

Only UNIVERSAL Can Offer you Features Like These —



New Milking Assembly with Scientifically balanced claw, Timed and Synchronized Air Release which prevents aeration rancidity, Patented Supermatic Sanitary Shut Off, and Calf-Nose Inflations.

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Auto-Lite Special Duty Contact Points are specifically designed and built to give superior performance under low-speed operating conditions. Big high-quality tungsten points provide *78% more contact area* than standard duty contacts; give you *top performance* and *longer life.*

The CAC Coil, with special built-in ballast, gives high voltage output. It reduces heat in the primary coil winding and maintains high voltage over a wide temperature range. It can be used on all Auto-Lite 6-volt systems and will give you *improved performance* at all engine speeds.

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Auto-Lite Original Service Parts are engineered for superior performance and specified by leading manufacturers as original factory equipment. They are available through better implement dealers, garages and gas stations everywhere.

Auto-Lite manufactures over 400 products including Spark Plugs, Batteries, Wire and Cable and Automotive Electrical Systems . . . sold throughout the United States and Canada.

Electrobrain, which goes to work when you push a button. It uses solenoids and a time-cycling mechanism to do the whole operation. Once the dairyman connects the lines correctly and puts the detergent and sanitizer in the containers in the machine, it will go ahead with the entire operation. It puts in the right amount of water at the right temperature and will do a better job than the dairyman because it never rushes the job. In the meantime, the dairyman can have three loads of manure hauled out.

Once you get the procedure worked out for pipeline cleaning, it is not complicated at all. The real job is to do the right thing at the right time after every milking. Every state that has a dairying industry of any size is either in the process of publishing, or has already published, a section in the milk code that gives recommendations for pipeline cleaning. Before a dairyman goes very far into the subject, he should write the dairy department at his state university for a copy of these recommendations. Usually the dealer from whom he buys his pipeline setup is going to be pretty sharp on the subject of what the local Board of Health inspector wants. A time-saving and money-saving suggestion is to get the dealer and your Board of Health inspector out in your dairy barn and let them each understand what the other man wants and what kind of equipment it will take to supply the requirements. Dairy inspectors are human. They are out to do the same job you are, to produce clean milk that customers will like. Each inspector will have some particular ideas of his own. It's good to get these ideas before you start installing stainless steel or glass pipe at three dollars a foot.

Milking parlors, pipeline milkers and C.I.P. have lightened the work load on dairy farms. Boys, and the women folks too, are willing to come out and help in the dairy barn.

Cleaning and sanitizing chemicals can be nearly useless if the right chemical isn't used for the right hardness of water, so the first thing a dairyman should find out is how hard his water is and what the right chemicals are for wash-up, and what the right chemicals are for sanitizing. Because of the wide variation in water types on farms throughout the country, the dairyman will need to work out his own cleaning program with his local Board of Health, and his supplier of wash-up chemicals. There are many good products available. The way they are used will determine the bacteria count of the milk and that is the pay-off on any sanitary program. Among the companies supplying dairy chemicals and supplies on a nation-wide basis are: The Diversey Corporation, Chicago 13, Illinois; Klenzade Products, Inc., Beloit, Wisconsin; Pfanstiehl Detergent Chemicals, Inc., Waukegan, Illinois; Wyandotte Chemicals Corporation, Wyandotte, Michigan.

Here are the four basic points in keeping C. I. P. systems really clean:

(1) Rinse immediately with water at about 100-110°F. Discard the rinse water.

(2) Circulate cleaning solution at a temperature of 160° for at least 15 minutes. Follow the recommendations of the manufacturer of the cleaning compound. Drain the system.

(3) Rinse with plenty of lukewarm water 110°. Drain the system.

(4) Sanitize just prior to next milking. Circulate 200 ppm chlorine solution or its equivalent for 10 minutes.

Here are some important points to consider which have been picked out of C. I. P. instructions published in many states:

(1) Provide hot water under pressure and in adequate amounts. An 80-gallon pressure hot water heater is the smallest that should be installed.
The method of recirculating will determine the amount of water needed. *But before you even start planning on C. I. P. be sure you have enough water to do the job.*

(2) Unions and gaskets should be flush to facilitate cleaning and draining.

(3) Pipeline gaskets should be non-absorbent and non-toxic.

(4) Lines should be made from approved stainless steel or glass.

(5) There should be no dead ends in the system.

(6) Lines should be pitched to drain. One inch per 10 feet is satisfactory. If entire line cannot be pitched to drain at one place, drainage ports should be provided.

(7) Lines should be arranged so they can be opened for inspection at points of change in direction of flow.

(8) A thermometer should be installed in the line near the discharge end of the recirculation system.

(9) Valves, can fillers and any other piece of equipment not cleaned-in-place should be hand-washed and stored in a sanitary manner.

(10) A wash tank should be provided large enough to accommodate the largest piece of equipment that is not cleaned-in-place.

(11) Teat cups and rubber hoses should be inspected and cleaned manually if necessary, even though they are in the recirculating system.

(12) Disconnect water lines from the recirculating system before milking.

(13) Cap ends of lines and put protective covering over stall cocks after cleaning to keep out dust and flies.

In Los Angeles County, where many of our new ideas in dairying seem to sprout, C. I. P. has been taken over by almost every big dairy operation. Cleaning procedures worked out by the Los Angeles Health Department under G. C. McFarland, Chief, Division of Milk and Milk Products, have taken bacteria counts down to new low figures during the last year. Says Mr. McFarland, "Pipeline milk installations can be washed cleaner than a conventional system if the operator knows his business."

It looks like the pipeline, the milking parlor, the bulk tank and the new automatic methods of handling milk may change the dairyman's job from that of a drudge who never knew when he was done cleaning up, into the most desirable spot on the farm. "And none too soon," says the old-time dairyman who has seen the trend away from dairying to the air-cushioned seats of modern, two-toned farm tractors.

AUTO-LITE spark plugs give you extra service in every farm engine!

Every year, the reliability of the engines in your farm equipment becomes more and more important to you. That is why the extra service and performance of Auto-Lite Spark Plugs in your tractors, trucks and other farm machines will pay you real dividends.

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HEAVIER INSULATOR with greater resistance to hi-voltage leakage and to breakage.

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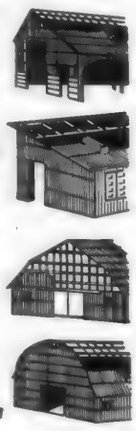

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NEW PAINTS FOR FARM JOBS

(*Continued from page* 61)

fish oils are combined to impart desirable properties to paints.

Titanium has largely replaced white lead as a pigment. Titanium is non-poisonous to livestock. It withstands yellowing longer, has greater whiteness and hiding power. When used as the only pigment, titanium has considerable resistance to blistering. When zinc is added in the pigment, discoloration by fumes is minimized. Zinc also improves durability.

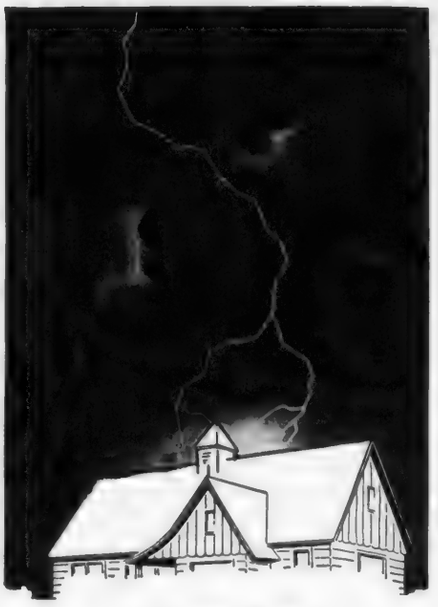
House Paint is the most familiar of the oil-base type. Quality brands contain about two-thirds pigment and one third oil vehicle by weight. Such paints are not limited to use on wooden structures, but may be used for any wood, metal or masonry exposed to the weather. White lead house paints age by crumbling and checking. Titanium-zinc paints powder or chalk slowly from the surface inward, giving rise to what are called self-cleaning or controlled chalking paints. Most lines of paint feature them nowadays. Rain washes the chalk and accumulated dirt away. Such paints are at their dirtiest about a year after application, when chalking begins and continues for about five years to the point when repainting is necessary. Self-cleaning paints should not be used on porch furniture or where the powder would rub off on clothing.

Roof and Barn Paint, generally speaking, is a second grade of house paint. Ordinarily it comes in red and green colors only. Such second grade paint often contains first grade ingredients which are not as highly processed as they are in more expensive paints. Mill-end runs are sometimes used, as in Sherwin-Williams *R & B Utility Paint,* manufactured from salvaged paints due to overgrinds and damaged containers of quality ingredients.

Breather Paints, available in most paint brands, form a rather porous film, which allows some moisture to escape from within a building without causing the paint to peel. Such paints often have a high percentage of pigment extenders at the sacrifice of more desirable pigments and oils. They cannot be made to withstand exceptional dampness, nor can they stop moisture from going both ways. *One Coat Paints,* for exterior use, like those in the Adelphi line, refer to one coat over a previously painted or primed surface. Composed of thick-bodied oils and large amounts of titanium, they form a film almost as thick as a two-coat job. They give best results when used in repainting surfaces where the old paint is still in good condition but needs refreshing. Once over and you're done, provided the color is about the same as the old color.

Enamels

There is no sharp line separating enamels and paints. *Trim Paint,* produced by all general paint manufacturers, is deeply-



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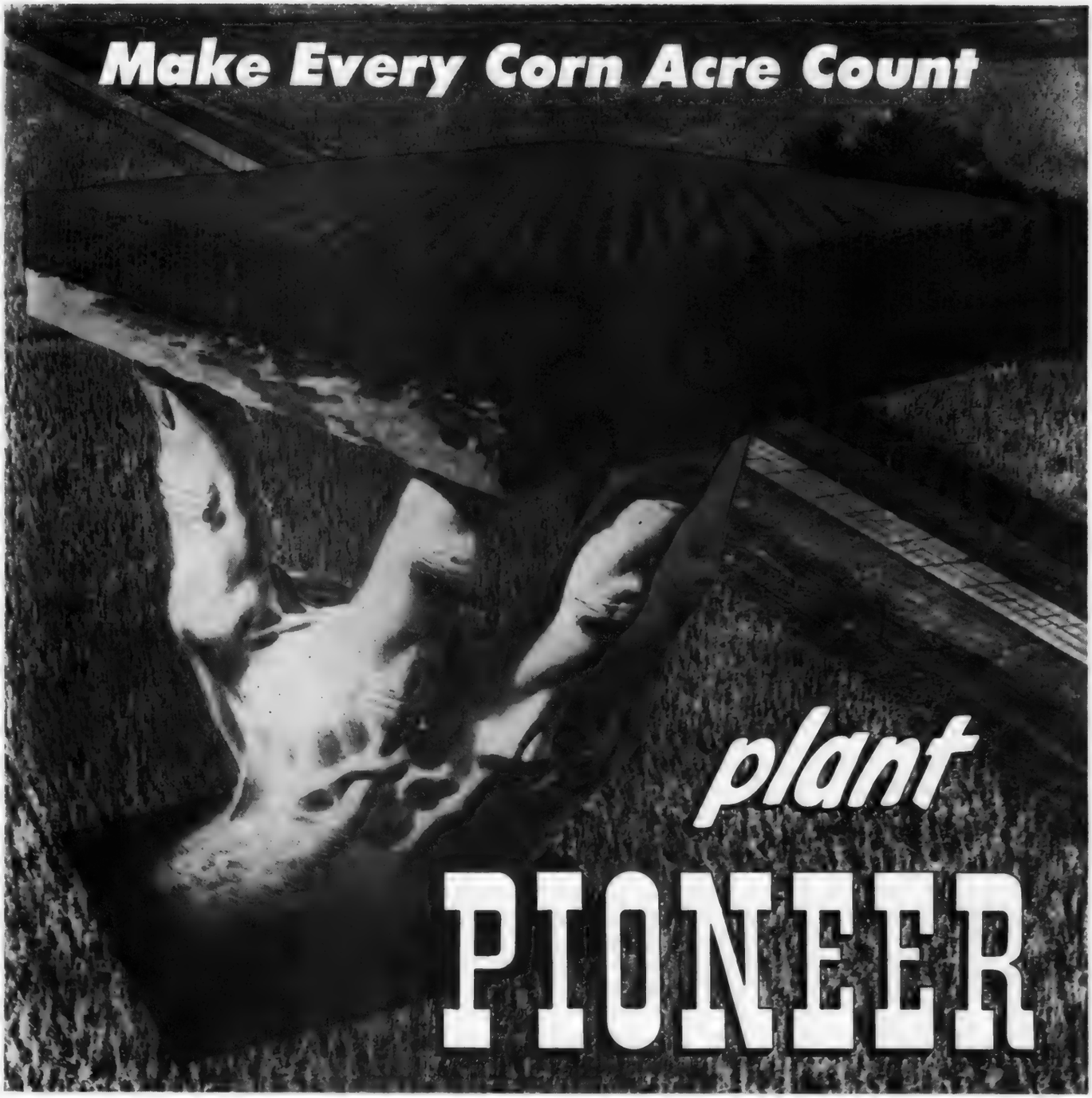

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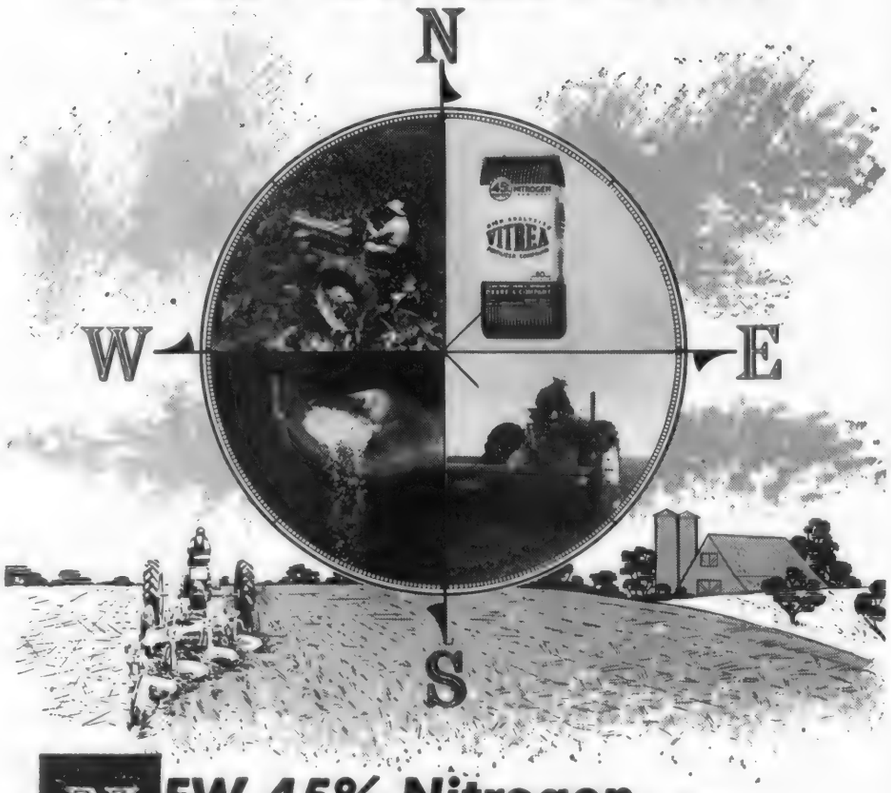
IS BEST ON ALL POINTS



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colored house paint with some varnish resins added. The true enamels are high in resinous compounds, which give them their characteristic fast-drying high-gloss and hard-finish qualities. Designed to flow on, leaving a smooth, tough surface with little brushing, enamels take considerable abrasive wear and tear, but they do not possess the elasticity of house paints. They wear thin or chip away without chalking. Interior types should not be used outdoors. Most exterior enamels can be used on any wood or metal surface, interior or exterior, but some are of special formulation to meet weathering or marring conditions, such as *Implement Enamel, Porch and Deck Enamel* or *Aluminum Enamel.*

Base Coats

Paints and enamels give best results when applied over priming coats. Old primers for wood were intentionally deep penetrating; current types give only limited penetration. They seal the surface and dry slowly to a flat finish, which gives good adhesion to succeeding coats. Primers are high in oil, low in pigment and lacking in resinous products which would result in a hard, glossy and fast-drying surface. With some brands of paint, oil may be added in small amounts so that the paint may be used as its own primer for woods. With other brands, directions on the can call for special primers, for the addition of oil to the paint would destroy the balance of oil to pigment. Plywood requires a special primer that prevents the grain from raising. *Firzite* is a good plywood primer. On non-porous metal surfaces, enamel will

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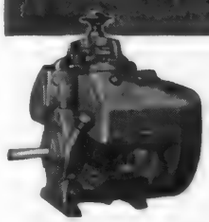
sometimes adhere without a primer, but first-class work calls for a primer followed by a flat enamel undercoater before the enamel finish is applied. Undercoaters give better grab to enamel and also overcome porosity variations that might cause uneven color results. However, spot priming without an undercoater is usually satisfactory for touching up farm tools with the new small spray can enamels like Sheffield's *Quick Spray*. Their extra cost is worth it, considering the saving in painting time and in cleaning brushes where small jobs are involved.

As a metal primer, red lead in fish oil is not as important as it once was. For iron and steel, zinc chromate, on which most metal primers depend, gives better adhesion and is more effective in retarding rust. In this connection, William Foy, chemist of the Foy Paint Company, says, "Don't expect miracles from anti-rust paints. No paint can hold very long over heavy rust scale and no primer can completely neutralize the oxidation once it has started. Wire brushing is the best means of getting rid of rust. Anti-rust paints prove most satisfactory as preventives rather than as remedies."

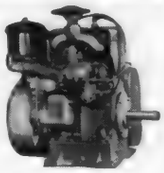
Zinc dust primers, made by all full-line paint companies, give rust protection to zinc-coated or galvanized metal surfaces. They may be covered with house paints or enamels which heretofore would soon flake off such metals. The use of zinc dust makes it unnecessary to wait for galvanized roofs to weather or to pickle them with mild acids before painting. Aluminum paint as a primer or finish coat on wood or metal owes its insulating, sealing and protective features to a process known as leafing. The aluminum, instead of being in powdered form, is in the shape of flakes or leaves which settle in overlapping patterns as the paint dries, making a weatherproof and waterproof surface. This leafing action renders aluminum paint desirable as a sealer to stop stains from breeding through wooden surfaces. However, in this regard, aluminum paint is no better than the vehicle in which it is mixed. Several types of new aluminum paints have become very popular. A Philip Carey product combines asphalt with aluminum flakes in a thick liquid which seals holes in metal roofs in the manner of roof cement, yet has the brightness and insulating values of aluminum paint. A Sheffield heat-resistant aluminum paint called *Red Hot* has been designed for use on tractor engines and grain dryer burners. The *Sapolin* line features heat resistant paints in colors. Until recently, aluminum paint could not be applied by roller; the aluminum flakes would be repicked up by the nap. Sherwin-Williams has introduced a special aluminum paint for roller application, which now makes roof and tank painting faster with considerable saving of material.

(Continued to next page)

WHY YOUR COMBINE or BALER SHOULD BE WISCONSIN-POWERED



This is the 4-cylinder, V-type Wisconsin Air-Cooled Engine used extensively on leading makes of combines and the larger balers.



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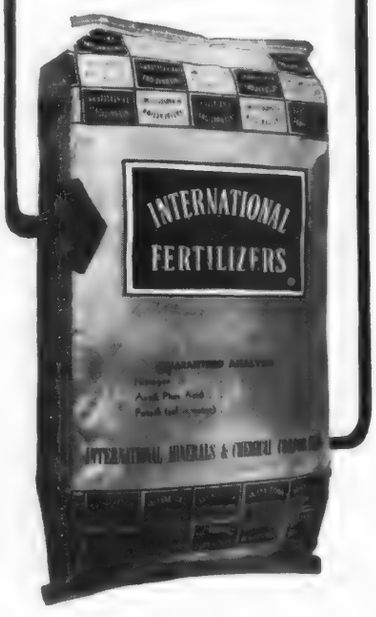

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Special paints containing creosote, like Johnston's *Creosote White*, or Penta, like *Wood-Rem*, give a measure of protection to fence posts and other wood exposed to fungus attack, but treatment by pressure with preservatives is far superior. Where mildew in humid climates and fumes from factories deteriorate paint, preparations are available to add to paints to counteract those conditions. Some lines of paint have such preparations already in them.

It's Work, But It's Gratifying

A good paint job depends on three things: the proper choice of paint, its quality and its application. The right paint for the purpose is the best beginning. Following label directions is the only sensible method of application. If quality paint fails, when properly applied, look for moisture as the culprit.

Paint jobs average 75 per cent labor costs and 25 per cent materials costs. It takes just as long to put on poor paint as it does the best. So buying a cheap paint really doesn't save much in terms of the total job cost.

Quality ingredients do not guarantee quality paint. The best of ingredients can be combined haphazardly to give disappointing results. Top grade paints are a product of elaborate and precise refining, grinding, filtering, mixing, regrinding and remixing. You can't recognize good paint in the can and you can't be sure from the formula. The best assurance of quality is to rely on name brands. Nationally-known manufacturers can't afford to risk their reputations by producing inferior paint.

GRAIN DRIERS

(*Continued from page* 67)

ture out of grain has always been to move it through air for ventilation, by shoveling it over, by moving it from bin to bin, or by recirculating it in storage with an elevator. Big commercial driers, those used by mills and processors, employ the same principle of moving grain through a ventilating machine on a continuous flow basis, with heat added to hasten drying. In the newer machines designed for farm drying, the principle of moving the crop through air is reversed. It is simpler to move the air through the crop.

Fans

Forcing unheated air through a crop by means of a fan is the cheapest method of mechanical drying. First costs are low, for several hundred dollars buys a lot of fan. Electric power costs are small. Fans can be inexpensively adapted to any drying system, bulk or batch, whether it be a pre-fabricated metal ductwork in a revamped haybarn, a slatted wooden floor arrangement in ear corn cribs, or tem-

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Offers greatest number of adjustments at low cost. Six foot mold-board is fifteen inches high. Fits all 3-point linkage.

Model 200 REAR BLADE
Blade can be tilted or extended to the right or left manually, and is instantly reversible. Ideal for "V" ditches. All positions from driver's seat.

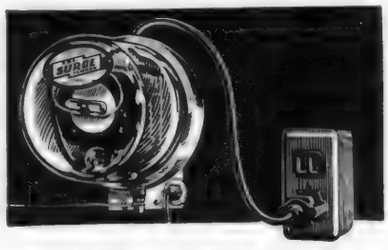
531

Write for COMPLETE INFORMATION

Nationwide Sales and Service

SHAWNEE MANUFACTURING CO., INC.
1947-AO N. TOPEKA AVE., TOPEKA, KANSAS

Surge FENCER
The Stock Controller with the
MERCURY SWITCH



Backed by Organized Surge Service

SEE YOUR SURGE DEALER

porary drying racks and bins for hay or grain.

All fans are rated according to the amount of air they can move in cubic feet per minute (cfm) in relation to the resistance against which they operate. This resistance, or static pressure, varies with the density of the crop and is measured in inches on a water gauge. For hay or ear corn drying, fans should be capable of from 10,000 to 30,000 cfm against static pressures around 1 inch or more, depending on whether the hay is loose, chopped or baled. Drying tight-packed grain calls for higher static pressures, up to 3 or 4 inches, but cfm ratings in the range of 3,000 to 10,000 are often sufficient. Multi-purpose fans, capable of operating efficiently at high or low cfm and in a wide range of static pressures, come high in price.

Propeller fans, usually the lowest in price, are often the noisiest but give good efficiency where static pressures up to 2 inches are needed. Centrifugal fans, the squirrel cage type, medium to high in price, are quiet in operation and are most efficient at static pressures of 3 to 4 inches. Vane-axial fans, which resemble a series of pancake spatulas mounted at right angles around a shaft, are highest of all in efficiency and are not too noisy, but cost way up there. Variable pitch blades give them a wide range of cfm and static pressures up to 4½ inches. They tend to bring down operating costs, for they give greater cfm per horsepower applied.

This smattering of science won't help a farmer set up his own drying system. But it can help him to understand why one fan costs $200 while another of the same size costs $400, or why one kind of 36-inch fan can do as good a job as another type of 48-inch fan.

Unheated Air

Farmers who have used unheated air to dry hay may be tempted to use this system on grain. Drying with unheated air has its limitations, however. Among the major grains, unheated air drying is not safe for

For Healthier Animals

SACCO® V-19

MINERAL FEED

When you add low-cost SACCO V-19, *the complete quality mineral*, to all rations, your livestock and poultry do *better*, on *less feed*! 24,000 units of Vitamin D added to every pound! See your Sacco dealer.

THE SMITH AGRICULTURAL CHEMICAL COMPANY

Columbus, Ohio; Indianapolis, [illegible]; Holland, Mich.; Saginaw, Mich.; Carey, Ohio

3 easy going TILLERS AND TILLER/MOWERS

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. . . FEATURING 60 SECOND SWITCH FROM GROUND WORKING TO MOWING . . . NO TOOLS NEEDED!

• SPADES
• FURROWS
• MOWS • WEEDS
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Step behind an easy-to-operate CHOREMASTER Tiller or Tiller/Mower and leave hard work behind! Tough garden and yard chores are done quickly and easily. The Tiller/Mowers add fast MOWING and LEAF MULCHING to this amazing versatility. Get a CHOREMASTER . . . highest quality, reasonably priced!

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QUALITY BUILT FOR YOUR JOBS . . .

1—Heavy Duty Tiller/Mower . . . new, big, rugged! Works ground to 21" wide, 9" deep; mows 21" wide, power propelled.

2—Town & Country Tiller/Mower . . . ideal for suburbanites! Works ground to 17" wide, 7" deep; mows 18" or 21" wide.

3—Heavy Duty Tiller . . . for the BIG garden. Works ground to 21" wide, up to 9" deep.

SELF PROPELLED IRRIGATION

Automatic! Without Labor! Unattended!

Irrigate ALL Crops!
Irrigate without labor!
Irrigate frequently!
Irrigate for Less Money!
Irrigate evenly!
Irrigate 'round the clock!

Imagine! Irrigate up to 160 Acres without moving pipe.

For the first time irrigation is easy — just push a button. Night and day, the entire system, on wheels and powered by normal water pressure, rotates slowly around the field, delivering from 1" to as much as 4" of water. High crops are irrigated as easily as low ones and regardless of how you plant. Crop damage by wheels is less than 1%.

Self Propelled Irrigation allows you to irrigate evenly and frequently. A forty acre field can be given 1" of water in 40 hours. Systems will operate on grades of as much as 5% and in all soil types. Systems are in use in many states.

If you are planning to guarantee your crops with irrigation, make sure you investigate this revolutionary development that makes irrigation easy. See your dealer or write:

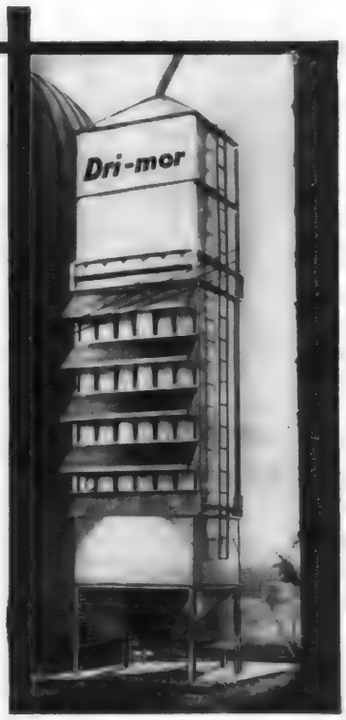
VALLEY

Manufacturing Company, Valley, Nebraska

how

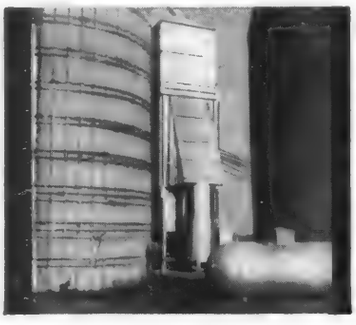
many acres

should you have in grain to make a farm drier pay off?



The advantages of on-your-farm drying are many fold . . . you require less storage space, you harvest earlier for greater yield, with less chance for weather damage . . . you get your crop into the market sooner when prices are better, you get more money for pre-dried grain . . . these and many other reasons make farm drying a big profit maker. Two big questions remain: how big should your operation be before a farm drier will pay off . . . and what drier should you buy?

Our newest brochure on the Finco DRI-MOR will give you a lot of valuable information on both of these questions. It is yours for the asking. If you are a producer of corn, sorghum, oats, wheat, barley, or rice, write for this free booklet.



The DRI-MOR is the most advanced batch-type farm grain drier on the market today . . . embodying many exclusive features:

Faster drying
No downtime for loading or unloading
Reduced operating costs
Improved grain quality
Greater capacity
Less maintenance

all pointed toward improving your operations and increasing your profit.

Send for your free brochure. No obligation!

Finco, Inc., Aurora 3, Ill.

Please send me your new brochure on the profit-making DRI-MOR, together with information on my specific operation.

	Corn	Sorghum	Wheat	Oats	Barley	Rice
I plant (check)						
acres (number)						
I feed (check)						
I sell (check)						

Name _____

(Route) (Post Office) (Township)

DRI-MOR *sold exclusively by Finco, Inc.*
Manufactured by Pierson-Moore Co., Lexington, Ky.

wheat, barley, sorghum and soybeans over 20 per cent moisture at the start, or with shelled corn and oats over 25 per cent. Furthermore, eliminating the last few degrees of moisture from grain is tough; drying ear corn from 18 per cent to a safe 15 per cent, or oats from 15 per cent to a safe 13 per cent, is difficult and sometimes impossible with unheated air drying. Drying time makes batch drying impractical with unheated air and causes operating costs to average about 2 cents a bushel, almost as high as with other means of drying. Under the most favorable conditions, drying grain with unheated air takes a minimum of 3 days and may take as long as 3 or 4 weeks to reach a safe condition. The big stumbling block is humidity. When the relative humidity is above 70 per cent, drying with natural air reaches an impasse. A suitable fan can do a good job of drying a crop on a dry day in June in Missouri or any day in the year in the arid regions of California, but comes a muggy day in August or a cold, drizzly day in December, and a fan might blow more dampness into a crop than it blows out. As every housewife knows, if she expects the wash to dry on a humid March day, she'll have to hang it in a heated basement.

Why Relative Humidity?

Humidity is always related to temperature. Relative humidity refers to the amount of moisture that can be held in the air at a given temperature before saturation takes place. By 50 per cent relative humidity weathermen mean that without changing temperature, the air could carry twice as much moisture. As air warms up, its moisture capacity increases. At 70 degrees, air can hold almost 3 times as much moisture as it can at 40 degrees.

That's where drying of crops with heated air comes in. Adding heat lowers the air's relative humidity and jacks up its ability to absorb water from a crop. Heated air can dry a crop in a matter of hours. Rain or shine, winter or summer, a farmer can now take wet grain directly from the harvesting equipment, dry it to marketable moisture and sell it in town at top prices within three hours after it leaves the field.

Time Versus Expense

Some heaters depend on low heat and a strong air blast; in others both air and heat are variable from low to high levels to meet conditions. Heaters are of either direct or indirect type. The former discharge heat directly into the crop, with less stack loss and better fuel efficiency. The combustion gases do not harm grain, but if such heaters are not properly adjusted, they can blow soot into a crop. A spark arrestor is helpful.

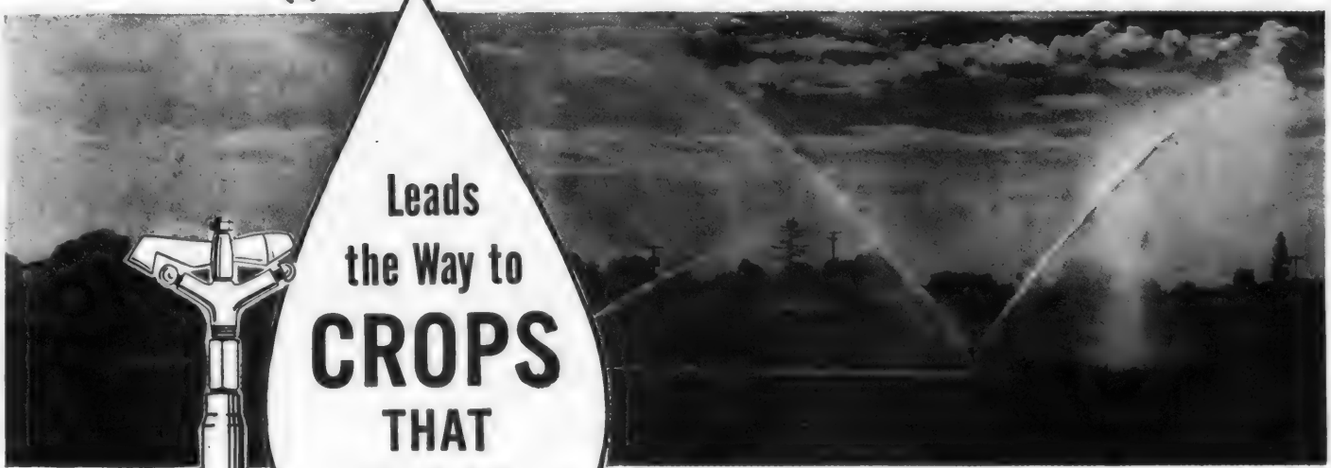
Indirect units heat a metal enclosure built within them, a "heat exchanger," and only the air from the exchanger reaches the crop. This adds a measure of safety, but runs the cost up and causes some fuel wastage. In using either type, it is a good idea to go over your insurance to see if you are protected.

Most of the smaller heaters burn fuel oil. Some have pot-type burners; the higher priced ones have gun-type burners requiring electricity, which limits their location to spots close to a power line. When you come to the real blasters, upwards of 750,000 BTU and as high as 4,000,000 BTU (BTU stands for British thermal unit, the amount of heat required to raise 1 pound of water 1 degree Fahrenheit—an average home furnace produces about 120,000 BTU), there is a fuel choice of oil, natural gas or LP gas burners, with gas giving lower operating costs in most parts of the country.

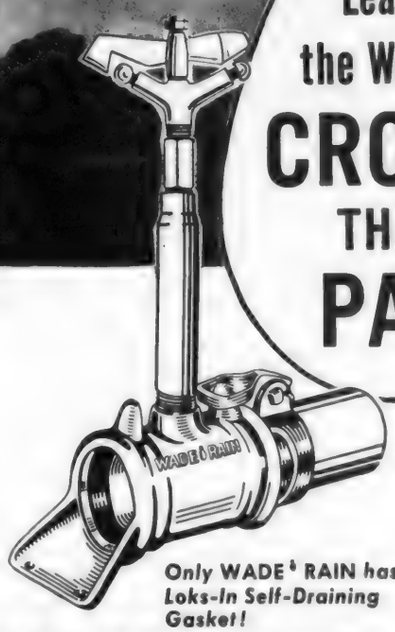
How much does it cost to dry grain with heated air? That's like asking how much it costs to heat a house. The power supply, whether tractor, electricity or auxiliary engine, the amount of moisture to be removed from the grain, the grain's depth and density, the duct efficiency, the weather, and the fuel, air and heat factors within the drier itself cause variations from a low of 1 cent to a high of 8 cents. The most efficient machines, in the hands of careful operators, dry at an average of 1½ to 3 cents a bushel for small grain, with shelled corn averaging between 2 and 4 cents.

(*Continued to page* 154)

WADE RAIN Sprinkler Irrigation



Leads the Way to CROPS THAT PAY



Only WADE RAIN has Loks-In Self-Draining Gasket!

Be Years Ahead with WADE RAIN

Give your farm all the WADE RAIN advantages for boosting crop yields and improving quality! WADE RAIN's exclusive features make lateral moving fast and easy . . . reduce crop production costs!

In addition to the world-famous manual move types WADE RAIN *offers . . .*

Labor-Saving—Time-Saving Mechanized Systems

With WADE RAIN mechanized systems you can move as much as a quarter mile of lateral line as a unit! WADE RAIN has three types of power moves to fit all farms . . . and save manpower during busy seasons.

Your Tractor Moves Sprinkler Line as a Unit . . . without going through crops. Unique new "pivoting" action of WADE RAIN Power-Shift wheel units produces revolutionary method!

Pulls Lateral Lines directly behind your Tractor. Simple . . . fast . . . sturdily built for years of profit-making use.

"Water on Wheels" moved by its own power unit. Complete Lateral rolls to new position "as easy as walking across the field". One Man Operation.

WADE RAIN Sprinkler Irrigation

Fits EVERY Size Farm . . . and EVERY CROP . . .

WADE RAIN increases the carrying capacity of Pastures seven to eight times! . . . extends the grazing season . . . makes extra cuttings of forage for your silo or barn . . . speeds the growth of Row Crops to reach the earlier, more profitable markets. Field Crop growers boost yields to new record profit! Orchardists increase yields of the better grade of Fruit with WADE RAIN Sprinkler Irrigation.

FREE Planning Service

Send for Free "FARM-FACTS" Planning Form — makes it easy to plan a WADE RAIN System that's just right for your farm and crops — we'll have a trained Field Technician visit your farm and help plan . . . no obligation.

Ask about 5-YEAR Purchase PAY PLAN . . .

Pay for your WADE RAIN Sprinkler Irrigation System out of added profits! Available to all qualifying farmers.

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If you feed Hogs, Cattle, Sheep or Poultry you need a BELL "Modern" Hammer-Mill to get the most profit out of farming.

GRIND YOUR OWN GRAIN & ROUGHAGES

Cut feeding costs and increase the weight of stock animals by feeding home-grown, GROUND shelled or ear corn, with or without shucks, oats, wheat, alfalfa, clover and soy bean hay. A BELL "Modern" Hammer-Mill will do it for as little as ¾ of a cent per hundred pounds. 1000 pounds of properly ground feed often produce as much Milk or Meat as 1250 lbs. of unground feed, thus the highest possible Feeding Value for growing pigs, and other stock animals is obtained at the lowest cost per pound of increased weight.

SAVE MONEY ON GRINDING COSTS!

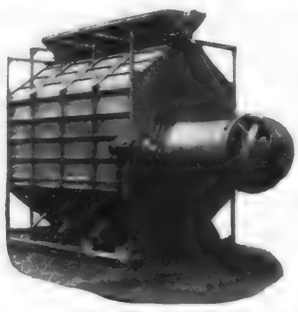
BELL HAMMER-MILLS are made for ELECTRIC or ENGINE POWER, in 2 Universal, Low Cost Sizes. Capacities up to a ton of shelled corn thru a ¼" screen, or 1400 lbs. of ear corn thru a ⅜" screen, per hour. Write today for full information.

BELL'S NEW MODERN HAMMER-MILLS

Send for Special Illustrated Folder and Prices today.

THE C. S. BELL CO. Mfrs.
Dept. F. HILLSBORO, OHIO.
CORN SHELLERS HAMMER-MILLS FEED MIXERS

Now You Can Solve Any Crop Curing Problem with HARTZELL Drying Equipment



And you can trust your Hartzell representative to recommend the equipment which is exactly right for *your* drying needs because Hartzell makes all types.

For complete details, check the items which interest you on the list below and mail the coupon today.

HARTZELL propeller fan co.
Div. of Castle Hills Corp.

Dept F., Agricultural Division, Piqua, Ohio

Please send me information on how I can make my farm operation more profitable by using:

- ☐ Portable Crop Drying Equipment
- ☐ Batch Drying Bins
- ☐ Fans for Natural Air Crop Curing

Name_____

Street or RFD_____

City_____ State_____

Portable Furnaces

Where both portability and flexibility are required, hot-air wagons, the wheeled driers, are a good bet. They look like a big stovepipe mounted on a trailer. Some can be used indoors, if vented, and are fine for warming a farrowing house or for thawing-out tasks. Prices list at $1,000 and up. A farm where the hay exceeds a few dozen tons or the grain to be dried goes beyond a few hundred bushels will need a unit in the $2,000 to $2,500 bracket. Of course, when you buy one of these portable forced-air furnaces, you still need a container to hold the crop.

In gaining portability, these units lose some heat through the canvas ducts by which they are generally connected to bin, barn or wagon. This minor heat loss was put to good use last winter by Harold Clark of the Flying Dollar Ranch, Fond du Lac, Wisconsin. It kept the workers warm in 15-below-zero weather while ear corn was being dried and stored in a modified hay silo.

Ducts are not needed on the new mobile driers which take wagon batch drying one step farther. Bud Haddix of Monroe, Michigan, has one with the fan and heater as an integral part of the wagon box. Haddix can load up to 175 bushels of oats on the run beside a combine and start drying on the home trip. The wagon unloads hydraulically in seconds. Extension sides give a six foot high load of ear corn or forage for drying on the trip to the barn.

Stationary Column Driers

On the fringe of the cornbelt, small acreage keeps drying mostly on a custom-work, emergency basis. That means fast drying and fast drying means column driers, designed for grain and grain alone.

The unit set up last year in Paris, Kentucky, by Doug Wilson is called a tower drier. That's just another name for an upright column drier, stationary type. It cost Wilson $4,000 but the 30,000 bushels of wheat put through it in a short stretch last August paid about half the cost. This drier looks like a square metal water tower, 6 feet each way and about 25 feet high. In three sections, the top section is a 155-bushel garner bin, which unloads by gravity into the middle drying section of 120-bushel size, to which the heating unit is permanently attached. In the drying section the grain is held in tubes like a steam radiator in reverse, with the grain inside the tubes and the heat blown around them. After drying, the grain drops into the bottom section, a 100-bushel holding bin, from which it is conveyed to truck or storage bins.

Wilson's drier was given a night and day workout at wheat harvest last season. July was wet. "Wettest I remember," says Wilson. "Wheat was a month late being combined. Everybody waited but the weather stayed sticky. Finally the com-

give your FARM WORK a lift

Cushman 780 TRUCKSTER

• 500 lb. payload capacity • Powered by Cushman Husky 4-cycle engine ... big vehicle shaft drive • Just ¾c per mile total operating cost

Ask your dealer for a FREE demonstration or write for illustrated literature. Dealer inquiries invited.

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CUSHMAN MOTOR WORKS, Incorporated

HASCO SPECIAL

For readers of this ad, for limited time only.

NEW! Low Priced!

TAG-EZE Cattle Markers

Applies In 30 Sec.

HASCO 133

per unit complete **85¢** ea.

IN LOTS OF 12 OR MORE
F.O.B. NEWPORT, KY.
Order Direct thru Dept. 6-49.

Unit Includes: Heavy brass tag, rust-proof zinc-plated Jack Link chain, revolutionary "S" hook.

1025 Applicator for applying.... each $2.00

COMPLETE LINE: CATTLE EAR TAGS, INDENTIFICATION MARKERS, EAR NOTCHERS, ETC.
Catalog and Samples FREE On Request!

NATIONAL BAND & TAG CO.
DEPT. 6-49 NEWPORT, KY.

DRIED MOLASSES

Omalass for PRESERVING SILAGE SWEETENING FEEDS

Omalass is 85% blackstrap molasses, dehydrated. Takes less, costs less because it's concentrated and there's no waste. Guaranteed dry, free-flowing. Write for folder.

FREE
Magnetic Breeding Calculator
if you send local feed dealer's name

Omalass 1901 E. EUCLID DES MOINES 13, IA

bines went to rolling to save what wheat they could. The trucks of wheat came into town in a stream and nobody would buy it. That wheat was wet—heating already. Every tobacco warehouse floor was covered with wheat, with farmers coming in every day to turn it with scoop shovels. Heartbreaking. Mine was the only drier around and it really got initiated. It made government loans possible for a lot of farmers around here."

Like most column driers, this tower unit has four safety controls. If one part of the machine clunks out, if the fan stops, if the gas runs short, if the flame is blown out or the grain overheated, the whole drier shuts down. Wilson has added his own refinement to the loading process. A mousetrap is suspended in the upper, garner bin. When elevated grain has nearly filled the bin, it presses against the spring of the trap, which is wired to a warning bell.

Operating costs run high, around 4 cents a bushel for drying wheat, but slower heating can reduce expenses. "Ten minutes with the heat on full blast will drop a full bin of grain about one percentage point in moisture," Wilson states. "Fifteen minutes of heat drops the moisture three points. You don't dry every kernel a certain per cent. You just dry *from* an average *to* an average and the moisture will migrate evenly. If you want to know what you're doing, you'll need one of the new quick moisture testers, at least until you get the feel of it. When the grain is dry, you have to cool it, which takes another ten minutes. Just shut off the heat and let the fan run. If you didn't cool it to nearly outside temperature the grain would pick up as much or more moisture than it had before. Also, hot grain would play hob with the rubber parts of our conveyors."

The Workhorses

On-the-farm drying is fanning up a twister that promises to topple every corn crib in the midwest. Like chicken or egg, it is hard to determine which came first,

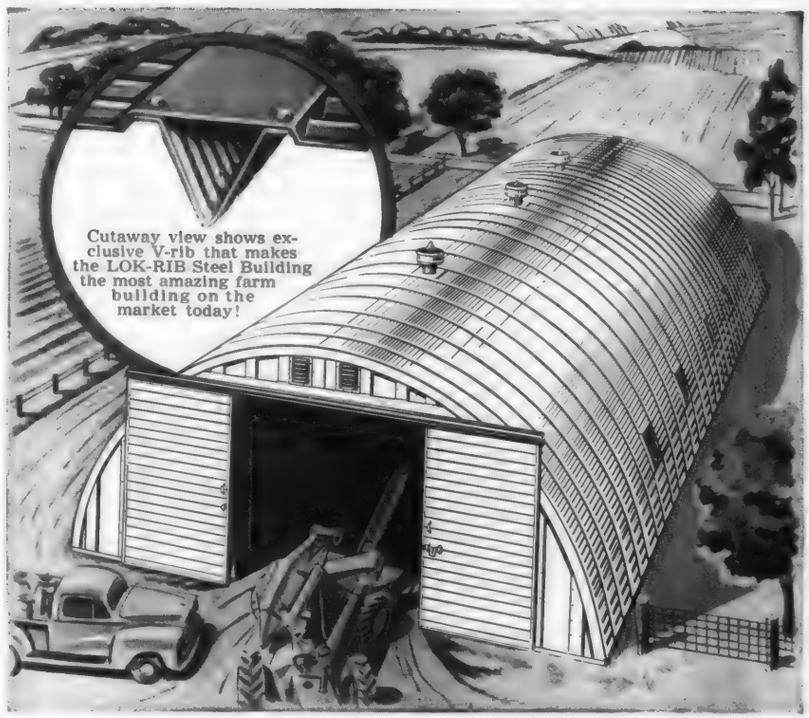
Surge

PLATE-TYPE STRIP CUPS

Detect Mastitis EARLY

No managed milking program is complete without the use of the strip cup. The Surge Plate-Type Strip Cup is easier to read—so you can detect mastitis earlier.

SEE YOUR SURGE DEALER


Cutaway view shows exclusive V-rib that makes the LOK-RIB Steel Building the most amazing farm building on the market today!

Even if you were a millionaire

you couldn't buy these features in any other farm building!

LOK-RIB

STEEL BUILDINGS

are factory-engineered and mass-produced to give you a top-quality steel building at a practical price

Lok-Rib's interlocking V-Rib is the feature that makes the LOK-RIB Steel Building completely different from any you've seen before. And only LOK-RIB has it. Because of it—you get these advantages:

EXTRA-STRENGTH—The interlocking V-Rib provides a box girder every two feet of building length. It's the kind of strength you want—the kind of strength you need to withstand heavy winds, heavy ice, unusual snow loads.

NO COSTLY FRAMING—Every LOK-RIB panel is both exterior sheathing and interior framing. You save high framing costs and get a roomier post-free interior for convenient housing and storage.

LONGER LIFE—Every panel is heavy, 18-gauge, Ti-Co galvanized steel. It's rugged and tough—gives you many years of protection.

QUICKER ERECTION—Because of simplified design and fewer parts, the LOK-RIB Steel Building goes up in a fraction of ordinary building time. And only simple hand tools are required.

PRE-PUNCHED—Every part is accurately matched and pre-punched at the factory. You save the time of costly field drilling usually spent in erecting ordinary buildings.

PRECISION FIT—Mass production makes sure that every part fits its neighboring part without trouble.

Ask your nearest LOK-RIB dealer to tell you the other advantages of this truly different structure. For the LOK-RIB Steel Building is not just another farm building—it's a building constructed on an entirely new principle that makes all other buildings old-fashioned. Use the coupon for complete information.

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EQUIPPED BARN

cuts hours off chore time

Operates his barn with production-line efficiency

FEEDS WHILE HE MILKS BY TURNING A HANDLE

Louden Measure-Matic feed system together with Louden Milking Stalls saves him countless steps and time.

Measured rations of feed slide from overhead bin to manger with the turn of a handle. Takes any type ground feed without clogging or leaking. Use with overhead bin without costly connections. Or, Measure-Matic hopper will hold feed supply.

CLEANS HIS BARN IN 10 MINUTES

He throws the switch of his Louden Dual-Unit barn cleaner and 10 minutes later the barn is clean. Litter neatly deposited in spreader outside. Louden barn cleaner elevator travels at 55 ft. per minute . . . fast enough to get liquids *and* solids. Load conveyed 14 ft. per minute at gutter level to separately powered elevator. No uphill pull to cause chain-strain. A rugged, powerful, easy-to-install cleaner that fits any barn.

Be the Man with a Louden Equipped Barn. Send today for big illustrated 96 page Louden Better Barns Book.

Est. 1867 The Louden MACHINERY COMPANY

323 West Court St., Fairfield, Iowa

Gentlemen: Send me your big, new 96 page Better Barns Book. I enclose 10c to cover mailing.

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A Subsidiary of Mechanical Handling Systems, Inc.

field shelling or corn drying, but when one moved in, the other just had to follow. These two, along with a third sheet-metal cousin, shelled corn storage, are changing more than farming practices and rural scenery. A wide range of industrial interests are involved.

Cause and effect are mingled. Ear corn can be stored safely in a well-ventilated crib at 18 per cent moisture, with 15 per cent preferable. Not so with shelled corn. With it, anything over 13 per cent is risky. Furthermore, tight storage is desirable to prevent damage from weather, rodents, birds, insects, and grain parasites. Since picker-shellers, corn combines and pull-behind shellers operate at top efficiency on corn of 25 to 30 per cent moisture content, the new harvesting methods plus drying and storage of shelled corn are necessary teamwork operations. However, in large-scale farming, with ear corn storage at $1.00 or more per bushel and new or converted shelled corn storage costing from 20 to 55 cents per bushel, the saving in storage costs has in a number of instances paid for both the new harvester and the drier.

For corn producers, the column drier, portable style, is taking over. These package-unit, galvanized drying boxes, designed to dry grain as fast as it can be harvested, are bringing pushbutton farming a little nearer reality. A dozen manufacturers are knocking each other out improving the new automatons. Fitted with electronic eyes, with recirculating augers which mix the grain for even drying, with thermostats and humidostats, with built-in grain levelers and loaders and unloaders, they go on alone while the farmer goes about his chores. He dumps a load of grain in an auger, sets a gauge or two, according to moisture desired, throws a switch and the machine does the rest. In some models, the heater automatically shuts off when the grain is sufficiently heated, but the fan continues running until the grain is cooled, when the fan likewise shuts off. Fully automatic models come around $4200, with fewer controls on the $3500 models.

In principle and in appearance they are all similar. The heater-blower unit is externally mounted on a metal bin, some 8 to 12 feet square. The grain to be dried extends in a horizontal column around a perforated metal duct laying lengthwise across the center of the drier bin. A 19-inch depth of grain has been found most practical, though some driers use a grain column as little as 15 and up to 24 inches in depth, according to horsepower available.

Streamlined Production

Most manufacturers make portable column driers with capacities from 300 to 600 bushels. Drying that amount of small grain or shelled corn fast—in 1 to 3 hours —requires high-powered fans and heaters.

DO YOUR OWN SOIL TESTING WITH Simplex SOIL TESTERS

BIGGER YIELDS—GREATER PROFITS

Are yours if you test your soils the SIMPLEX way. SIMPLEX Soil Testing prevents late test reports — is quick, easy, accurate — and is within your "know-how."

COMPLETE KIT

All the reagents and apparatus necessary for a complete chemical diagnosis of the soil; plus tissue tests for Nitrates, Phosphorus and Potassium. The apparatus will last indefinitely. Refills of the reagents may be secured at any time.

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Operating costs vary from 1½ to 3 or 4 cents a bushel.

Myron Mather, who does custom drying around Marshall, Wisconsin, says, "It's easier to bring the drier to the corn than to bring the corn to the drier." Once harvest starts, his portable unit doesn't get much rest. His propane dealer delivers gas to the farm where Mather operates, so he has only a single drying unit to haul. For night drying, he has a lighting system rigged up to his tractor battery. On rainy days, he covers the bin with a tarp. His 350-bushel drier completes a batch of average corn in about 2½ hours—1½ hours to dry, ½ hour to cool and ½ hour to load and unload—or about 1,000 bushels a day, a good day's run for a picker-sheller.

What if you don't have drier capacity to keep up with harvesting equipment? "You don't have to dry every bushel," Mather points out. "You just use the old blending method that mills have always used. Say you have grain coming in at 18 per cent moisture. Your drier holds three wagon loads. You dry a batch down to 12 per cent. The next three wagon loads don't have to be dried; you just auger them out at the same time the drier elevator is emptying into the same storage bin or truck. That gives you 15 per cent corn, with a half per cent leeway under a marketable 15½ per cent for top No. 2 corn. Getting the last few per cent of moisture out takes more time and heat. By blending you can double your capacity.

"Going down to 10 per cent with corn or 7 per cent with beans would bake the crop. So you can't expect to go down to 10 per cent corn and blend it with 20 per cent corn for an average of 15. If you're going to seal your corn, it's best to dry it all down to 13 per cent without blending. And one more thing on capacity: augers and conveyors can be your bottleneck. A big drier bin with slow loading and unloading augers is really a low-capacity machine."

Spend Money to Make Money

In figuring whether or not it pays to dry a crop, shrink is an important factor. In drying corn from 25 per cent to 15 per cent, the shrink or the weight loss will be about 10 per cent. If 15 per cent corn is selling for $1.44, 25 per cent corn will normally go at a 27 cent discount,

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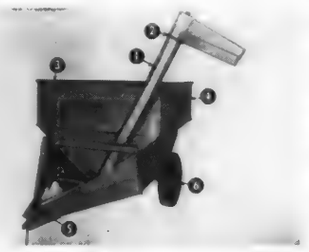

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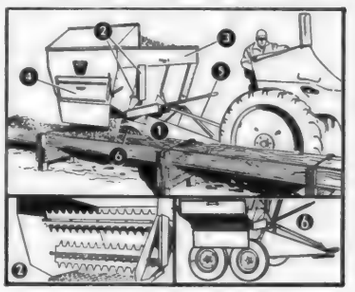
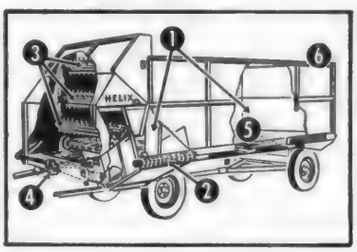
For Silage, Green Forage, Ground Feed, Grain, Ear Corn

1. Endless 40-inch-wide steel conveyor belt floats load out of box.
2. Dual beaters mix ration—even with heavy molasses—help unload it.
3. Full 95 bu. capacity—optional extension sides give 135 bu. capacity.
4. Tailgate is spring loaded—grain-tight and easy opening—no catches or bolts to freeze. Delivery height over bunk adjustable.
5. PTO drive. Feed discharge controlled from tractor seat. Unload up to 135 bu. in 2 minutes.
6. Tandem axles optional, extra; single axle on 15" drop center wheels standard.



HELIX CROSS-CONVEYOR UNLOADERS



Handles Silage, Green Forage, Ear corn and Dry Grain

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2. Adjustable elevator for different bunk heights—removable for direct delivery.
3. Beaters (2 or 3) mix ration even with molasses and aid unloading.
4. PTO drive through gear box transmission; 20 different unloading speeds—2½ to 22 minutes for full load.
5. 2-section all-steel conveyor belt full width of box—can't clog or pack.
6. All-steel welded construction.

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2. 2-section all-steel conveyor belt full width of box—can't clog or pack.
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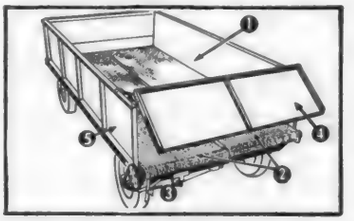
4. Tailgate is spring loaded—grain-tight and easy opening—no catches or bolts to freeze.
5. Available as a plain box, drilled and punched for conversion any time to rear-end or cross-conveyor unloader.



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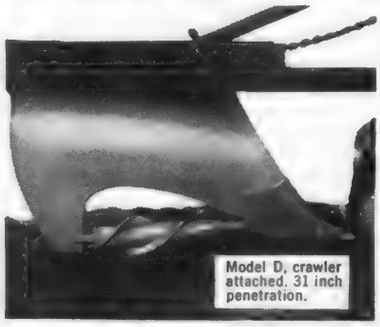

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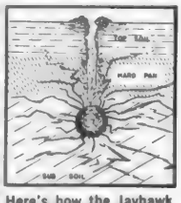

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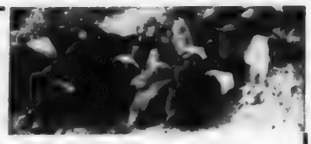
or at $1.17 net. Drying 25 per cent corn costs about 2.5 cents a bushel operating costs (depreciation not included) plus the 10 per cent shrink loss (of $1.44 corn) of 14.4 cents, making 16.9 cents total drying charges against a possible 27 cent discount for undried corn. This gives a drying profit of 10.1 cents per bushel. On that basis, a $4000 drier could be written off in 10 years if used for 4,000 bushels of grain annually. A University of Wisconsin survey shows that a drier will pay out with a minimum of 6,000 bushels of grain alone each year or with 70 tons of hay plus 3,000 bushels of grain. When grains are harvested very near safe storage percentages, profits from drying are doubtful. The cost of handling and drying corn from 16 or 17 per cent down to 15 per cent, for instance, is likely to be greater than any discounts for moisture. Shelled corn to be sealed at 13 per cent moisture on government loan is a different matter; the spread between new grain prices and support prices is a drier salesman's best friend.

In tenant-landlord relationships, who buys the drier? In some cases, the landlord buys the drier and the tenant furnishes the fuel and power. Typical contracts in Indiana call for the tenant to furnish the drier, but he charges the landlord on the basis of local custom-drying rates, for the landlord's part of the corn. Custom charges vary. Some are on a flat rate basis of 3 to 10 cents per bushel. Others are based on some sliding scale such as 5 cents minimum per bushel up to 5 per cent moisture and 1 cent per point of moisture above that. Some deals call for the landlord to buy the drier, which gives the tenant a better chance of financing a picker-sheller or snapper-head combine.

Does Drying Hurt Grain?

Authorities differ as to maximum temperatures for safe drying. Temperature alone is no criterion. Humidity, grain moisture and drying speed are factors. Generally, 110 degrees F. is considered safe for grains to be used for seed purposes. Above 110 degrees (grain temperature, not heated-air temperature) germination may be destroyed. Mills which produce starch, corn oil and gluten feeds will not buy grain known to be mechanically dried, for unless it is dried at temperatures under 150 degrees F., which they have no way of determining, the grain interferes with the milling process. Alcohol yield from grain dried at temperatures over 110 degrees is sometimes decreased. The baking qualities of wheat are lessened when drying temperatures exceed 180 degrees. Oil is more difficult to remove from soybeans and is decreased in quality if the beans are dried at temperatures over 120 degrees. To date, and especially with wheat, germination tests are the best industrial checks against overheating. Even though germination itself is of no concern, it is a very sensitive indicator of other qualities in grain. As for feeding value,

FERNDALE FARMS



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grain is not hurt by drying, except that overheating can decrease palatability. In two government tests, carload lots of mechanically dried corn were checked against carload lots of naturally dried corn. Protein content was unchanged by drying, but carotene and vitamin A content of the heat-dried corn was twice as high as in the naturally dried corn.

FARM BOOKS

(*Continued from page* 38)

previously written an entire book on this subject. The final section, "You and your special problems," discusses the many diseases and physical problems that man is heir to. An added feature in this well indexed, clearly illustrated book is a 60-page dictionary of medical terms giving both the definition and pronunciation of over 2,000 words.

Can We Solve the Farm Problem? *by Murray R. Benedict. The Twentieth Century Fund, New York, $5.00.*

A recent editorial in a metropolitan newspaper observed that one of the cardinal weaknesses of America's foreign aid program was the complete ignorance of the average citizen of what goes on. Unfortunately, the same is true of farm policies. The five-sixths of the nation's population who are non-farmers have only a limited idea of the complex plant that is the modern farm, and their knowledge of governmental farm programs is confined to a hazy notion of the millions annually expended on price support. Probably 95 per cent of the farmers themselves (and farm editors, too) couldn't distinguish the "basic commodities" from the Stegall items or explain the difference between old and modern parity—granting they could define parity. This is the public which must be the judge of our farm policies.

In "Can We Solve the Farm Problem," the Twentieth Century Fund has attempted to give the American people a detailed and orderly analysis of federal aid to agriculture. Dr. Murray R. Benedict, professor of agricultural economics, University of California, and author of a companion volume, *Farm Policies of the United States, 1790-1950,* was chosen to do the job of assembling and analyzing the facts. This comprises the first 11 chapters of the work. The final chapter consists of the report of the Fund's Committee on Agricultural Policy, a group of a dozen men and women concerned with agriculture. The number of signed footnotes appended to this chapter indicates that there was something less than complete unanimity of opinion here. This reviewer would be inclined to go along with committee members Caldwell and Murphy whose dissenting statement is based on a feeling that the report "seems to lack . . .

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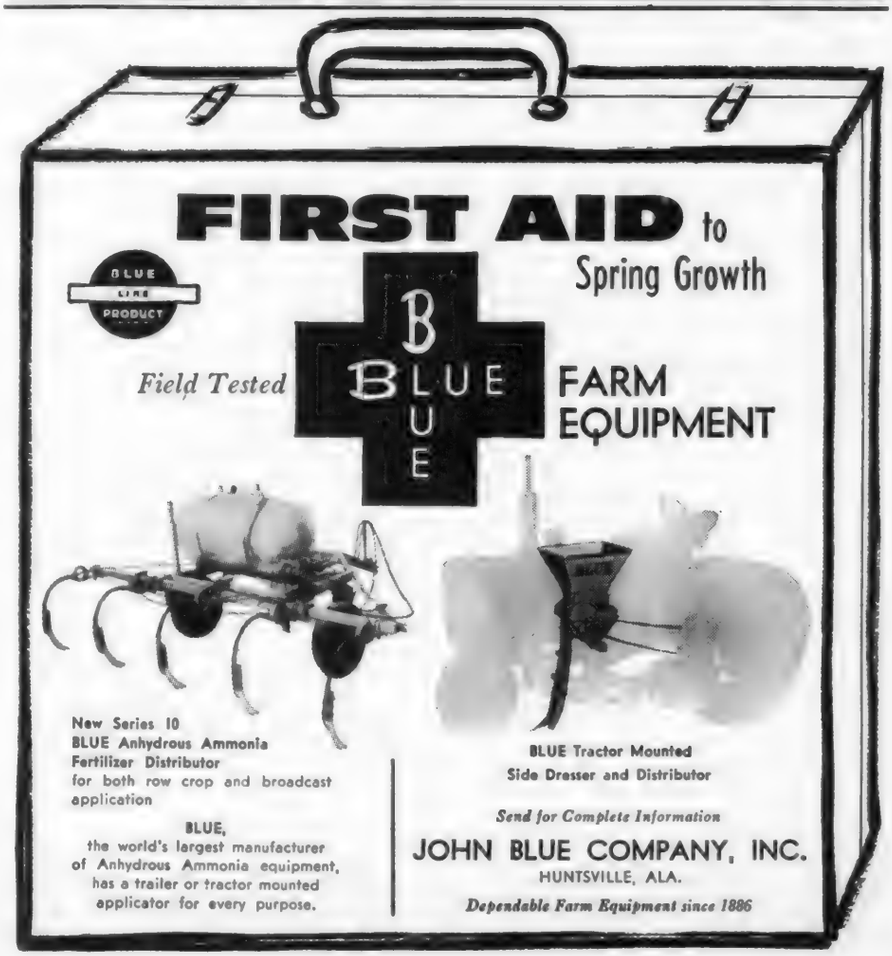

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a realistic sense of the immediate pressure of farm surpluses and of the urgent need to deal with this problem effectively and quickly in order to keep farm income in balance with the income of the rest of the economy."

Dr. Benedict recognizes that the development of the farm program must be "approached from a variety of angles: economic, historical, political and possibly even sociological" if it is to be really understood. Yet it is the economic angle which receives the lion's share of the treatment.

The first two chapters, "Causes and Nature of the Farm Problem" and "Characteristics and Importance of Agriculture," should be required reading for all editorial writers and others who will be offering comments on the farm program during the coming political campaign. Sandwiched between these and the committee report are detailed analyses of every facet of governmental assistance to agriculture.

It is discouraging to see the paradox of plenty proving such a puzzle to some of the best trained minds in the field that they are driven to describe such a calamity as a drouth as "lucky." This is the comment of Edwin G. Norse, former Presidential Economic Adviser, in a footnote to the committee report.

The general reader will be annoyed if not repelled by the constant use of such economic jargon as "excess capacity in the industry," "current maladjustments" and similar phraseology. And this is unfortunate; for nothing is so badly needed right now as a widespread understanding of the causes and perplexities of the farm problem. Nevertheless, this is a book which carries the names and numbers of all the players and should be in the hands of all who hope to understand the game. A selective reader will learn much from it.

***Profitable Sheep,** by Spelman B. Collins. The Macmillan Co., New York, $5.25.*

When Spelman Collins began this book he decided that the beginner (or the old hand at sheep raising for that matter) should be told how to do things rather than what should be done. With this basic assumption, he has produced an eminently practical book that will be of real help to those starting in sheep.

When talking of the breeds of sheep, Collins strays from the usual practice of

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giving a pleasant description of each breed interlarded with pictures of champion stock. He discusses breeds from the practical point of view that they have been adapted to do their best under particular farm or range conditions and so he helps his reader in selecting a breed by discussing the conditions under which they will be expected to do a job. He also discusses the best rams to cross with each type of ewe—again with farm or range conditions in mind.

Collins does not simply suggest that a good way to get an orphan lamb adopted is to cover it with the pelt of a dead lamb or that the ewe's teat should be opened if it has been ticked in shearing and healed over—in each case he tells exactly how to do the job and uses an excellent set of drawings to show the operation. Being a westerner, Collins draws heavily on methods which have been developed and tested on the range (he recommends using the farmer's teeth to draw out the testes in castrating, for example) but he also describes handling techniques more commonly used in the east. To beginners in all parts of the country, this book is definitely recommended reading.

THE EDITORS

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An understandable book on the complex subject of fertility.

Irrigated Soils—by Thorne and Peterson $6.50
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Farm Management

A Practical Guide for the Beginning Farmer—by Herbert Jacobs $3.00
A book to give you an intelligent start in farming.

The Farmer's Handbook—by John M. White $4.95
Easy reference book on crops, livestock, and farm problems.

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The Farm and Ranch Record Book $3.85
Loose-leaf farm record-keeping book. Ideal for income tax purposes. Refill sheets available.

Miscellaneous

Can We Solve The Farm Problem?—by Murray R. Benedict $5.00
A review of our agricultural dilemma.

The Complete Medical Guide—by B. F. Miller $4.95
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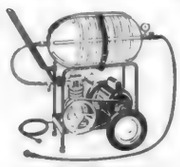

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WHICH BULL SHOULD I USE

(*Continued from page* 56)

genetic make-up and the result could well be a heifer that wouldn't pay her way.

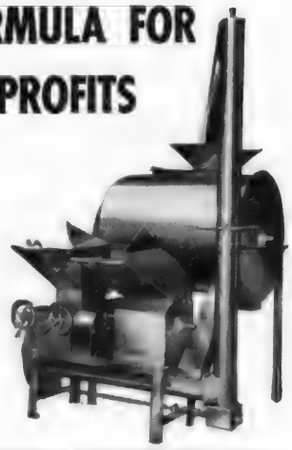
Still another complication occurs because of the mechanics of genetics. In almost all of the cells in the body of the bull and cow the nucleus contains the chromosomes—believed to be 30 pairs—which carry all of the genes that influence inheritance. The sperm and the egg are the exceptions. These cells start out with the full 30 pairs, but, during the process of maturing, a division takes place and each mature cell ends with half of the chromosomes, and so half the genes. Just which chromosome in each pair goes into the sex cell is a matter of chance so that when the inseminator thaws out a tube containing 10,000,000 living sperm from a bull he is actually inseminating a vast number of different arrangements of the chromosomes. It is this chance arrangement of the genetic carriers in both the sperm and the egg which gives us quite different offspring even though they are full brothers or sisters, which we think of as being the same genetically.

Geneticists are hard at work trying to devise some means of identifying the genes which influence production and finding some way to tell when and which high producing genes are present. In the meantime, what do they advise the farmer to do? In general, their advice is to cull out the low producers—if the genes which favor low production are recessive, you won't be throwing away an animal with valuable genetic qualities this way—and breed the best producers to bulls whose proof shows that they pass on high production to their daughters. In this way the herd will be accumulating pairs of genes both sides of which favor improved production. Some geneticists also suggest breeding for dairy type, even though they can point to little or no correlation between type and milk production.

Picking the Producer

Selecting the cow that is a high producer of milk and butter fat requires testing and record keeping. A dairyman should not only know the total production of each cow during her lactation, but also how rapidly she came into top production after calving and how long her period of high production lasted. Some cows with high total production start out with a great flow of milk and taper off rather rapidly; others start rather slowly, but persist in good production through the lactation period. Both these traits seem to be inherited and the farmer should take them into consideration when selecting a bull to mate with the cow. The milking characteristics of his daughters will tend to show the traits he is passing on. One important milking trait which seems to be inherited from both bull and cow is the

FORMULA FOR PROFITS



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ability of the heifer calves to milk out quickly and completely. Total lifetime production is another such factor—some bulls which pass on a trait for early productivity may get an undeserved reputation for production when only the early records of their daughters are taken into consideration. These promising bulls should be watched to see if their daughters carry on their good records into later life.

An additional complication in picking a bull is environment. There is an old proverb which says that breed is stronger than pasture. Unfortunately it is not entirely true; a cow responds to feed and

The artificial breeding studs keep their many bulls in excellent health through exercise.

care more than we usually admit. Either her genetic make-up or her environment can limit a cow's production. A bull, whose daughters have given him an outstanding proof by bettering their dams in production *may* have done so because they were handled differently than their dams, just as a bull with an indifferent proof may look bad because of the care given his daughters.

Just to illustrate the chance nature of each breeding and to show what an important role environment plays, take the case of the great Holstein cow, May Walker Ollie Homestead. Back in the early 20's this cow was discovered in northern Minnesota by the Minnesota Holstein Company. She was producing some 600 pounds of fat under very ordinary farm conditions. They bought her and started pouring the feed to her. In 1923, this Cinderella cow produced 31,610 pounds of 3.9 per cent milk making a total of 1,218.6 pounds of fat for the year. Excited by this championship performance the company went back and bought a full sister to May, who was also producing 600 pounds of fat on the home farm. They put the sister on the same feed and milking program that had made a champion of May, but she continued to produce only 600 pounds of fat. The moral is that May had the genetic make-up for outstanding production which was limited by her environment on the home farm while her full sister was producing to her genetic capacity on the home place and, so, improving her environment could not raise her production.

Though proof on a bull is a tricky thing

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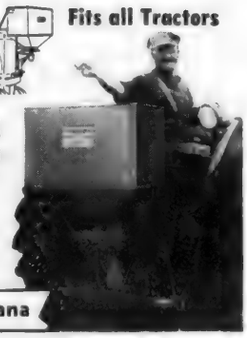

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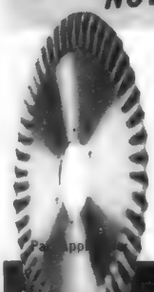

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to evaluate, it is the best method we have today by which to judge a bull. The most reliable proof will come from bulls which have a large number of daughter-dam comparisons in several herds. If a bull is able to raise the production of a large number of daughters over their dams in different herds under varied conditions his proof should carry a lot more weight than that of a bull which may have a more spectacular proof in a single herd. This latter bull may have achieved his high record because of improved handling, or even when the environment remained the same, simply because of a particularly fortunate cross with a group of cows. The wise dairyman will make a thorough study of the proof of every bull in the stud that he might use and will keep up with all of the new information on them as new records are compiled.

As far as producing genetically uniform herds and taking advantage of fortunate nicks, frozen semen has enlarged the breeding opportunities enormously. For the skillful breeder who wants to use line breeding or even closer inbreeding techniques, freezing offers the possibility of storing large quantities of semen from particular bulls for future use. The same storage facilities hold good for the man who discovers that one bull produces unusually good calves when bred to his line of cows. Most bull studs will sell such a breeder semen from the desired bull and store it for him in their freezing lockers until he needs it. There is, of course, a small storage charge, but this is no job for the home freezer since semen must be stored at 110 to 150 degrees below zero Fahrenheit.

Type

Dr. L. O. Gilmore, the author of "Dairy Cattle Breeding," said recently: "Type is what is looked for in the show ring and has a definite though small correlation with production. Yet, I advise dairymen to keep type in mind when selecting a bull. Few cows are ever culled because of poor feet or legs, but I've been to too many sales not to realize that a good looking cow will always bring a higher price than an ugly one even though their production records are the same."

Size is one aspect of type which Dr. Gilmore concedes has a definite, though small correlation with production. "In any breed," he said, "the larger cows will out-produce the smaller ones. We don't have the facts, however, to say that they will do it more economically." Size is an inherited characteristic and can be used in bull selection.

Udder size and attachment is another factor that is passed on by inheritance and seems to have a bearing on production. A cow with a big udder that is well attached *may* not be a good producer, but a cow with a small udder is sure not to be, and if the udder attachment is poor,

it may limit the producing life of the cow.

Depth of body is also inherited and is a little like udder size. A good deep body doesn't guarantee that the cow will be a good roughage converter, but without this capacity she is less likely to be. On the question of roughage conversion, it seems certain that some bulls and cows can transmit the ability to use large quantities of roughage economically. As yet, however, little has been done to single out these desirable animals.

Good feet and legs, a straight line along the rump, and well placed ears don't fill the milk pail. These inherited beauty marks will, however, add dollars to the price of the cow if she is ever put on the auction block. For this reason alone, they are worth considering when picking a bull.

Selecting for Type

"I would never cull a high-producing cow because her rump sloped a little or because she had slightly sickled legs," Wayne Saxton, a Michigan breeder of registered Guernseys said, "but I would try to improve these defects in her offspring by selecting a bull that transmitted high production and also good rumps and legs. The only way I know to do this is to get to know the bulls myself. I have seen and studied every bull I've ever used and most often I've also seen his dam and some of his daughters. I can't exactly tell you *how* I know any particular bull will cross well with one of my cows, but by studying them all and knowing the daughters they've produced I get a feeling that this bull would cross well with this cow.

"To begin with," Saxton continued, "I had my herd classified for type and went over every part of every animal with the classifier. As each animal is graded, you get to be keenly aware of the defects you would ordinarily overlook and forgive just because she's yours and you like her. If

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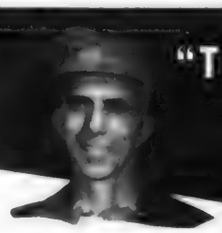

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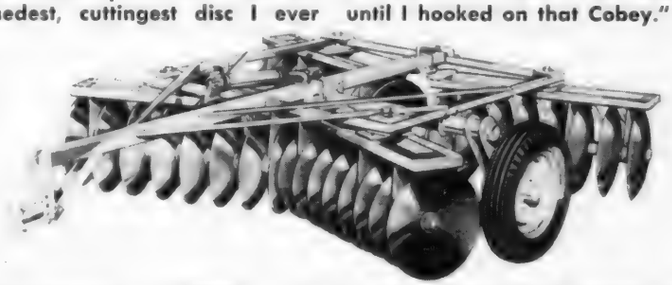

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you're going to breed for type, then classification is just as important to you as production testing is in order to breed for high production."

The farmer who can't spend the time Saxton does in visiting the bull stud and inspecting cows on other farms can still get a lot of type information from the inseminator who delivers the semen and from the publications of the artificial insemination organization that owns the bulls.

The inseminator knows his bulls and from actual observation as well as from information given him by the stud knows what production and type qualities each bull is passing on to his daughters. Most of them are anxious to work with the farmer in planning a breeding program. "I'm so tired of being told, 'You pick me a good bull, Joe,' when I go to a farm," an old hand at this business said, "that when a farmer really seems interested in the bulls I give him the works. I've got pictures, production records, and type analysis on every bull in the stud and I can usually point out heifers in neighboring herds to show what the bulls are producing. If one of my Holstein customers has a cow that is a little shy on size, we've got at least three bulls that are outstanding in producing big growthy calves so we go over the records on these bulls and see what other qualities they have, what their defects are, and what production their daughters are making. We have bulls with good production proof that have improved feet and legs from a classification of 74 to 81 points and we have bulls that invariably produce heifers with good well-attached udders.

. "The farmers I really love," he continued, "are the boys who ask me to drop by when I'm not too busy and help them plan the program in advance. Too many of them will wait until I have my rubber glove on and am trying to fit the bulb onto the inseminating tube before they start asking about the bulls. Chances are that I may have no semen from the bull which would seem best for their cow when they wait until I arrive at the farm before giving the matter a thought."

The dairyman who gets much of his information from the literature put out by the bull studs will have to learn how to evaluate the writing. Some of the studs feel that in all honesty to the farmer they should emphasize the poor points of the bull: others feel that in all fairness to the bull they should emphasize his good qualities.

The man who writes for the New York Artificial Breeders Coop., for example, is obviously a born pessimist. When he writes about a bull he spends most of his space talking about loose shoulders, sickled legs, plain heads, low fore udders. When he lets himself go and becomes enthusiastic he comments that the daughters of a particular bull are rather hard to fault. The breeder is left to find the good points for himself and, since this is one of the finest collections of bulls anywhere in the world, that is not too hard to do. The optimists who write for most of the other studs, on the other hand, make much of

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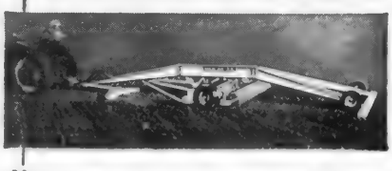

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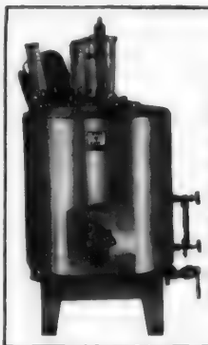

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SPRAYS • ROLLS • TILLS SNOW-PLOW
Eshelman Tractors, Tillers, Riding Rotary Mowers for Better Lawns and Gardens. Advertised in GOOD HOUSEKEEPING and Leading Magazines. Amazing Savings. Write for Free Literature.
ESHELMAN CO., Dept. R-263
109 Light St., Baltimore 2, Md.
1 to 8 HP
Shipping Points: BALTIMORE • CHICAGO • RENO

Crib Plans FREE!
Send for FREE crib blueprints with list of all materials. Also Elevator catalog showing 10 styles.

MEYER FARM ELEVATORS CUP AND PORTABLE
Simplest, strongest made—no short turns. Heavy-duty Portable 18" x 22" wide. Priced Right. Also Big 20" wide model at AMAZING LOW PRICE. Elevates everything—baled hay, corn, small grain. State if interested in BUCKET or PORTABLE.

MEYER MFG. CO.
BOX 752 MORTON, ILLINOIS
Makers of Famous Meyer Elevators

HOW TO KEEP BEES

Pollination is very important to the successful growing of legume, fruit, and vegetable crops; and Honey Bees are by far the most dependable instruments of pollination.
Let us send to you at no charge, booklets on beekeeping. Extension Bulletin #253 which tells of experiments with Honey Bees and clovers, and your 1956 catalog of Root Quality Bee Supplies—Everything you need to start this spring in time for the early fruit blooms and the clovers that follow.

THE A. I. ROOT COMPANY
DEPT. 30 — MEDINA, OHIO

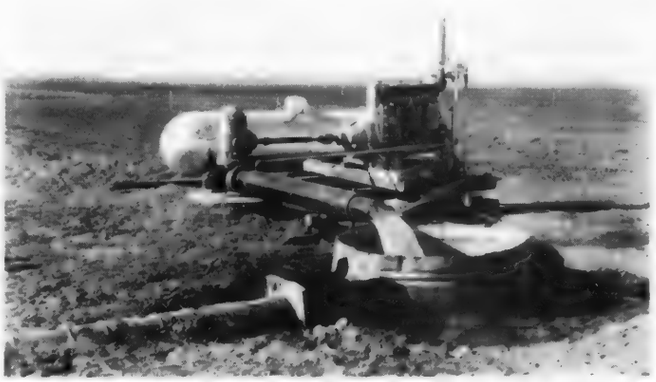
the bull's good points and touch on his poor qualities more by implication with such statements as, "For best type results, mate with cows level in rump and having wide rear udder attachments." It doesn't take Dick Tracy to tell which bull is passing on what kind of rumps and udders. Most farmers soon learn to go along with the writer's style and draw the correct conclusions.

"From a genetic point of view," Dr. L. O. Gilmore says, "correcting type defects is not a difficult thing to do as compared to the problems we face when we try to pin down the genes controlling production; I have said that the one excuse for breeding for type was to collect on it from those who are willing to pay, but I am convinced that it has a value for the breeder himself, an aesthetic value. Whenever I take visitors to my own barn these days I make a point of letting them see a little heifer I have there that's one of the handsomest animals I've ever raised. I can't predict what she'll do when we start to milk her, but I've got to admit that she gives me a lot of real satisfaction every time I see her."

HOW TO BUY AND FINANCE AN IRRIGATION SYSTEM

(*Continued from page* 91)

dealer knows that a bad system can hurt future sales. But if he did refuse to correct an error in design I'd first go to the distributor. If that failed, I'd go on to the various manufacturers. From experience I know that the manufacturers would have a man out in short order to straighten things out. But suppose that even this failed, then I'd go to the Sprinkler Irrigation Association with



Gasoline engines can also be run on L P gas, butane or propane, or natural gas. This deep-well pump supplies large volume of water with low pressure for surface irrigation.

my complaints. They have no policing power, but every manufacturer of irrigation equipment knows that his competitors will be sitting on the board that will review the complaint and that if it is justified and he does nothing about it, they will have ammunition to use against him in the field.

"Where a system failed to live up to the written specifications," Tribble concluded, "I have rarely seen a complaint go beyond the distributor."

How to Finance the System

"Buying the irrigation system, with all its problems, was easy compared to paying for it," a farmer said recently. But financing a system is not as hard as it once was. Enough farmers have shown the value of irrigation in the humid east, as well as the dryer sections, to convince even the flinty-hearted banker. Banks which once shied away from irrigation loans are now beginning to realize that a good part of the risk was in their own minds.

An even more important source of credit has come from the irrigation industry itself. As dealers have become established in the field, they have taken over part of the job of financing their customers. A usual method of stretching the cost of a system is to

for service beyond price

specify DEMING FARM PUMPS

DEMING TURBINE PUMPS

These precision-built units pump maximum quantities of water from wells of any depth or from lakes, rivers, canals, or other surface sources. Economical use of power, minimum maintenance and rugged durability insure low pumping costs.

Deming Turbine Pumps can be furnished for wells with inside diameter of 4 inches or larger; in capacities from 12 to more than 3,500 gallons per minute; and for operation by electric motor or with proper power take-off for other available source of power.

DEMING JET PUMPS and WATER SYSTEMS

Pumps are easily convertible for either shallow or deep well service. Quiet operation — only two moving parts of pump. Thrifty on power cost. Easy to maintain. Full range of capacities from the smallest to 2450 gallons per hour.

THE COMPLETE DEMING LINE

Name your needs for farm pumping equipment. Deming offers you an unequalled range of selection to match the best pump for every job. The complete line includes horizontal and vertical centrifugal pumps, shallow and deep well turbine pumps and jet pumps, power driven reciprocating or plunger pumps. A Deming Dealer is located in your area for qualified service.

USE THIS NOW!

THE DEMING CO., 510 Broadway, Salem, Ohio

Please send FREE literature on the items checked.

☐ Deming Irrigation Pumps. ☐ Deming Jet Pumps.
☐ Illustrated booklet "How to Select Your Water System."

NAME _____

STREET or RFD _____

TOWN _____ COUNTY _____ STATE _____

☐ Check here if you do not know where to locate the Deming Distributors or Dealers in your area.

Keeping Day-to-Day Irrigation Costs Down!

Important Factors To Consider Before Buying

LABOR COSTS • PUMPING COSTS • DEPRECIATION • SAFETY CONTROLS

First There Are Labor Costs

These may well be your highest single expense in the operation of an irrigation system. Plan your layout from the start for efficient pipe handling to keep this cost to a minimum. Check your layout carefully before you buy a system. It takes time to move pipe. A small amount of time saved on each move, when multiplied by the number of moves per season, can make a big difference in your earnings. As you consider different systems, ask yourself "Which layout does the best overall job with the least amount of labor?" Let your Marlow dealer help answer this question. He can offer you the experience of planning hundreds of irrigation systems, many of which will have been for land similar to yours.

In planning your flood irrigation system, minimize your labor requirements by careful layout of main ditches.

Then There Are Pumping Costs

You must consider the direct cost of gasoline, diesel oil, LP gas, natural gas, or electricity which varies widely, as you know. Find out the cost per horsepower for each of these in your area . . . and make sure that your pump is driven by the cheapest. Perhaps you can use a power-take-off on equipment you already have.

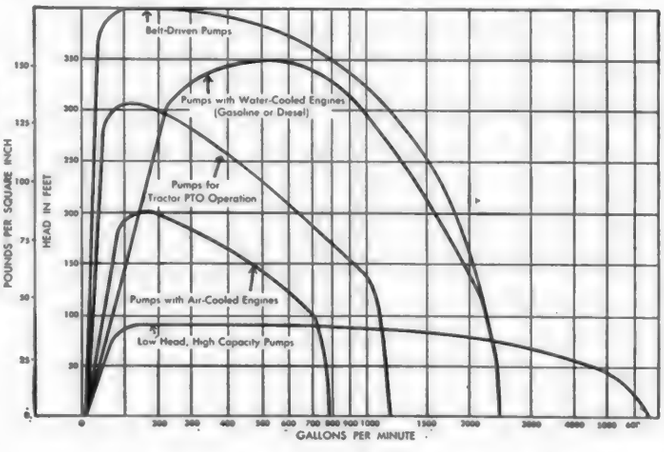
Even after you start pumping, the cost of moving water to the roots of whatever you grow can vary greatly. If your pump is not efficient or is not properly used, most of your power dollar will never splash on a plant. On the other hand, a good pump . . . properly matched to your system . . . will let your crops soak up most of your power dollar.

Frankly, the effectiveness of a pump depends on (1) quality of design and (2) on where in its operating range it is used. Of course, your pump must be run at the point where it delivers the right capacity and pressure to your system. Therefore, you must make sure that you have a pump that is using your cheapest power and is operating at or near maximum efficiency when it is delivering the capacity and pressure *your* system needs.

To make sure that all your power dollars are turned to water, Marlow

Lay out your sprinkler irrigation system for minimum pipe handling and you reduce your labor costs.

The various lines of standard Marlow pumps cover these ranges of pressure and capacities under reasonable continuous duty operating conditions.


Belt-Driven Pumps
Pumps with Water-Cooled Engines (Gasoline or Diesel)
Pumps for Tractor PTO Operation
Pumps with Air-Cooled Engines
Low Head, High Capacity Pumps
POUNDS PER SQUARE INCH
HEAD IN FEET
GALLONS PER MINUTE

offers the widest choice of irrigation pump types and sizes available anywhere. From this broad selection you can be sure that your Marlow dealer can offer you one or more models which will operate your system competently ... while operating with maximum economy.

Depreciation Is Important Too

Handle your pipe, sprinklers, and couplings gently, keep them clean, and they will last almost indefinitely. However, keeping a pump and its power unit clean and lubricated is *not* enough. If the power unit must be overloaded or overspeeded to deliver the capacity and pressure your system needs, it will rapidly depreciate with many unnecessary repair bills and much lost time from irrigation.

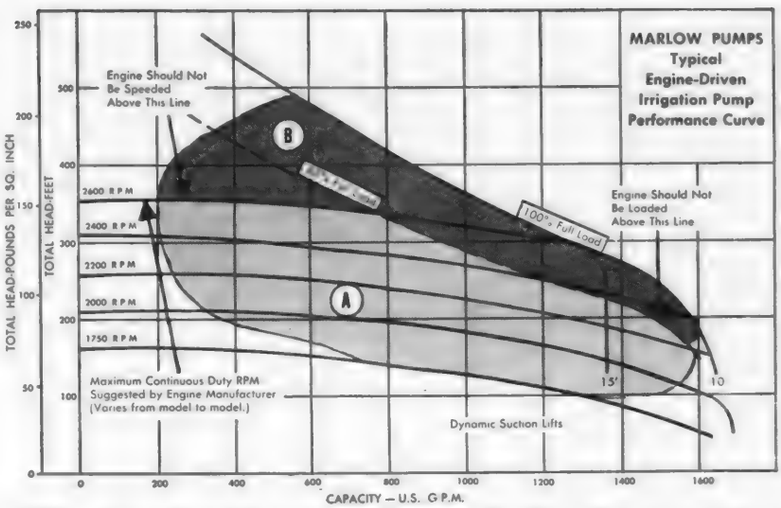
Make sure that the power unit of your irrigation pump is operating under a reasonable load, when the pump is delivering the performance your system needs. It should operate at no more than 80% of maximum engine capacity, and its speed should not exceed the manufacturer's recommendation for continuous duty operation.

Every engine-powered Marlow pump is mounted on a power unit which has ample power to operate the pump at rated capacity without overloading or overspeeding. We strongly recommend that no pump be selected for a system when its power unit must be run under a heavier load than suggested above. Instead, we suggest a larger pump and power unit.

In this way, when you buy a pump you buy a power reserve that will insure you of moderate depreciation with many years of satisfactory operation.

Finally, Make Sure That Operation Is Easy

Before you buy, think about operating your system. This can be simple, or it can be the source of many irritating interruptions. When operating, only one part of the system will require attention. That is the pump. Like any piece of power equipment, it requires fuel, lubrication, regulation, and supervision. If it is provided with the proper fittings and controls, operation will be automatic with no attention on your part. In the table on the right is a list of equipment which will make operation easy. The safety controls regulate and protect your investment. They make it possible to operate your pump unattended. Safety controls are the cheapest and best insurance you can have on an irrigation pump. High engine temperatures, low oil pressures, or water failure can damage your power unit extensively. All but the smallest Marlow pumps are guarded against each of these with appropriate safety devices ... at no extra cost.



(A) If your system operates at pressures and capacities in this area, your power unit will have ample capacity to perform without overloading or overspeeding. Under these conditions, your pump and power unit will run easily with years of satisfactory service.

(B) If your irrigation system operates at a pressure and capacity which fall in this area, you will be drawing on the power unit's reserve right from the beginning. Much faster depreciation will be the result. You should have a larger pump and power unit.

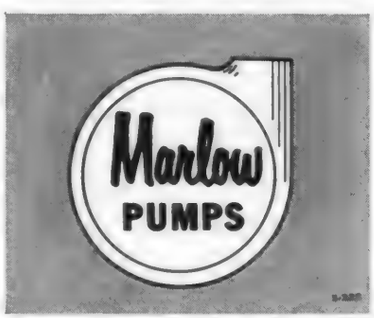
MARLOW ENGINE-DRIVEN IRRIGATION PUMP LINE

Equipment Supplied On "Standard" Units

PUMP DISCHG. SIZE	1½", 2"	2", 3"	3", 4"	4"	4", 6"	6"
ENGINE MAKE	Briggs & Stratton		Wisconsin	Willys	Chrysler	GM Diesel
FEATURES						
Standard Construction						
Priming Mechanism	—	YES	YES	YES	YES	YES
Discharge Check Valve	—	YES	YES	YES	YES	YES
Threaded Suction & Dischg.	YES	YES	YES	YES	YES	YES
Strainer Supplied	—	YES	YES	YES	YES	YES
Base Mt. or Wheel Mt.	YES	YES	YES	YES	YES	YES
Skid Mt. Available	—	—	YES	YES	YES	YES
Starting Method	ROPE	ROPE	CRANK*	ELECTRIC	ELECTRIC	ELECTRIC
Fuel Tank Supply	YES	YES	YES	YES	YES	—
Std. Safety & Control Devices						
Pressure Gauge	—	YES	YES	YES	YES	YES
Water Failure Cut-out Switch	—	YES	YES	YES	YES	**
High Head Temperature Cut-out Switch	—	—	YES	NOT NEEDED	NOT NEEDED	NOT NEEDED
High Water Temperature Cut-out Switch	NOT NEEDED	NOT NEEDED	NOT NEEDED	YES	YES	YES
Low Oil Pressure Cut-out Switch	***	***	YES	YES	YES	YES

*ELECTRIC START IS AVAILABLE AT EXTRA COST. **AVAILABLE AT EXTRA COST. ***NOT POSSIBLE WITH B. & S. ENGINES.

This chart shows the accessories and controls supplied as "standard equipment" with Marlow pumping units. Make sure that your pump is fully equipped. If it is, both installation and operation will be simplified.



MARLOW PUMPS

Division of Bell & Gossett Company

RIDGEWOOD, NEW JERSEY

Morton Grove, Illinois Longview, Texas

See Your Marlow Dealer

He is an irrigation specialist who can help you produce better crops at a better profit. Upon request we will be glad to forward literature on Marlow pumps. As the leading manufacturer of sprinkler irrigation pumps, Marlow offers an exceptionally broad line. Pumps are available in many different types. This includes: gasoline, diesel or LPG engine powered pumps, electric motor driven units, pumps for belt drive from any auxiliary power source, and models designed particularly for connection to your tractor. Your Marlow dealer can select the exact pump for your specific needs. See him today.

You can install your own irrigation system with USS NATIONAL* PLASTIC PIPE

*Trademark

Quick . . . Easy . . . Portable . . . Flexible

● Installing irrigation lines and sprinkler systems with lightweight polyethylene USS NATIONAL Plastic Pipe can be a one-man job. You can carry it anywhere—a 200-foot coil of two-inch National Plastic Pipe weighs only 86 pounds. It's easy to cut, and the fittings are of the insert type, quickly secured with stainless steel clamps. No adhesive necessary.

You can run flexible National Plastic Pipe anywhere—around corners or over obstructions. And it retains its toughness and flexibility over its entire working range from minus 90°F to plus 120°F.

Only 100% virgin "on grade" polyethylene raw material is used in the manufacture of USS NATIONAL Plastic Pipe. It is resistant to attack by rust, corrosion, acids, alkalies and salts. It won't crack or break with rough handling, even at very low temperatures. And due to its smooth interior surface, it offers very little flow resistance to the liquids passing through it. USS NATIONAL Polyethylene Plastic Pipe is available in sizes from ½-inch to 6 inches in diameter, in a variety of wall thicknesses.

For further details, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Ask for Bulletin No. 29.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS NATIONAL plastic PIPE

UNITED STATES STEEL

charge a third of the price as a down payment and collect the rest over a two-year period. Interest on such a transaction is usually the same as would be paid on a bank loan.

One major manufacturer of irrigation equipment offers a standard financing plan requiring a 30 per cent down payment with the balance spread over 36 months.

F.H.A. Loans

If all other sources of credit fail, all is not lost. There is still the government. In the summer of 1954, Congress passed legislation to extend the coverage of the soil and water conservation loan program (which had been in existence since 1938 for the 17 western states) to cover the rest of the nation. This legislation enables a farmer who has exhausted all other sources of credit to finance an irrigation system through the Farmers Home Administration.

Farmers seeking such a loan can get help in making out their formal application from the county office of the Farmers Home Administration. A decision as to whether to make the loan or not is made by the county committee of three men, two of whom *must* be farmers. They will check the experience of the farmer to make sure that he is a good farming risk and they will certainly check to see that he can get proper technical assistance in planning the irrigation system, for they know that a poorly engineered system won't do the job.

The F.H.A. makes two kinds of loans; either they advance the money from government funds or they insure a loan made through a private lender. In either case the borrower pays back his loan through the F.H.A. office and pays four and a half per cent interest on the amount borrowed.

During the first year of operation, this expanded program loaned $18,186,000 to 3,697 farmers and 34 groups of farmers. Over three-quarters of this money went into irrigation, the rest into soil improvement and conservation projects. At the end of their first year, October 1, 1955, the county offices had around 2,300 applications for loans being processed. It usually takes more time for an F.H.A. loan than it does for borrowing from other sources, so it is wise to get an early start here.

The loans are made for periods up to 20 years for individuals or 40 years for groups, but the farmer is expected to refinance the loan at any time when he becomes able to obtain a private loan at reasonable rates and terms.

Twenty years may seem like a long time for such a loan, but there is an old saying that if you want the time to pass quickly, just give your note for 90 days.

LONG GRASS SILAGE

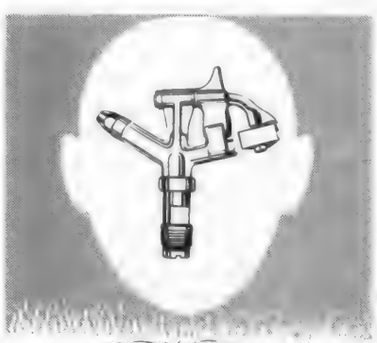
(*Continued from page* 86)

Here are some pointers to keep in mind when gathering and moving long grass crops with a buck rake during silage making: Mow the crop high. Buck the crop from the swath in the same direction it was mowed. Keep the rear part of the buck rake two to six inches above the ground with the teeth riding firmly on the surface to gather the crop. Keep the point ends in line and level. For safety it is best to carry the load no more than 18 inches above the ground.

Bob Workman, who milks Holsteins in Knox County, Ohio, has made long grass silage for two years, but Workman uses his baler for the job. He mows the grass, rakes it, and follows immediately with the pick-up baler and wagon. The green crop makes a heavy bale, so Workman reduced the length of his silage bales to two feet, a bale which can be handled by one man.

He stores this crop in a 60 ton trench silo near his dairy barn. The bales go into the silo in layers. On top of each layer Workman breaks a few bales and spreads some loose material. It is tractor packed and the silo is topped with Sisal paper and sawdust. He spreads preservative only on the top layer where the spoilage is greatest. Workman says his cows like long grass and respond to it with increased production at the milking machine.

Handling long grass in the bale is heavy work, on the wagon and in the silo. But,

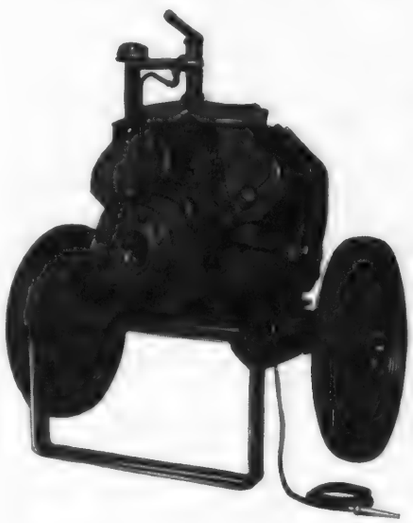


RAIN-O-MAGIC
HEAD - WORK
Makes the DIFFERENCE
Wise farmers get better efficiency from their irrigation systems . . . and more profit from their crops with RAIN-O-MAGIC Sprinkler Heads. Even, gentle, natural water distribution . . . automatic compensation for pressure changes . . . dependable rotation. Superior precipitation pattern benefits *all* the plants . . . eliminates dry spots and flooded areas. Gravity-operated impactor assures trouble-free service. Get RAIN-O-MAGIC Sprinkler Heads. Write for more information today.

Mitchell Mfg. Co.
FORT SMITH, ARK
Established in 1910

Put more "GROW" in the growing season

with MYERS PRESSURE Rain irrigation pumps



Bigger yields—up to 100% greater—and quality that demands top market prices are two important benefits of sprinkler irrigation. When water is added regularly, plant growth is continuous . . . preventing permanent growth loss due to short dry spells even when seasonal rainfall is normal.

Now is the time to plan for a Pressure Rain growing season. Compare these features of Myers irrigation pumps, then ask your Myers dealer to help you lay out a yield-boosting sprinkler system . . .

COMPLETE LINE with capacity ranges up to 1,800 gallons per minute, pressures to 200 pounds. Eight engine-driven models. Skid or wheel mounted. Three models for flexible coupling or belt drive.

ENGINES—Air and water cooled. Can be furnished to operate on LP fuel or natural gas.

SAFE DESIGN—Safety switches prevent damage due to loss of prime or overheating. Fuel pump and fuel line are supplied for use of large remote fuel tank. Eliminates fire hazard and frequent shutdowns for refueling.

MINIMUM UPKEEP REQUIRED—Continuous performance ratings obtained at 80% of engine throttle, assuring economical operation and long life.

QUALITY BUILT by Myers . . . the quality name in pumps and water systems for over 80 years.

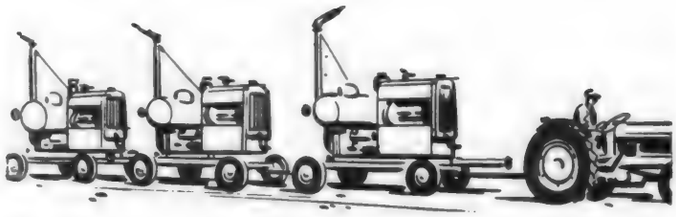
Myers® WRITE TODAY FOR YOUR FREE COPY OF "RAIN ASSURANCE"... MYERS POCKET GUIDE TO IRRIGATION METHODS AND EQUIPMENT

Myers PUMPS

WATER SYSTEMS, SPRAYERS AND WATER SOFTENERS

Profitable Territories!

A few selected, profitable sales territories for Myers' new line of Pressure Rain irrigation pumps are now available. Write today to: The F. E. Myers & Bro. Co., 4303 Orange Street, Ashland, Ohio.

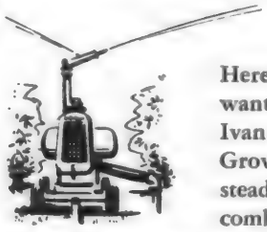


SUNLAND GROVE DEVELOPMENT CO.

SPECIFIES HERCULES POWER FOR

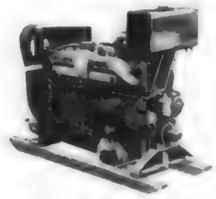
NEW IRRIGATION EQUIPMENT

Photo courtesy of Llewellyn Machinery Corp. Miami, Florida



Here's how to have water where you want it and when you need it. Mr. Ivan Maser, Manager of Sunland Grove Development Co., Homestead, Florida, has found the right combination for his irrigation needs.

Three Hercules Model RXC Power Units operating on L.P.G. pump water from drilled wells and power three new 1000 G.P.M. portable sprinkling units. Each unit irrigates 2½ acres. After approximately one hour operation, the units are moved to another well and then the process is repeated.



The special Hercules irrigation engine, at right, is available for operation on Gasoline, L.P.G. or Natural Gas. Six models from 141 to 404 cubic inch displacement are produced as complete irrigation engines ready to operate your pump.

Whether your irrigation is by sprinkler system or flooding — specify dependable Hercules Irrigation Engines and Power Units. For details on these engines, write the factory or see your nearest Hercules distributor and ask for Irrigation Bulletin IR-401.

Engine Manufacturing Specialists Since 1915

HERCULES ENGINES

HERCULES MOTORS CORP., 149 Eleventh St., S.E., Canton, O.

where the labor is available, the bale is a good method of making long grass silage. One of the real advantages is the ease of getting it out of the silo at feeding time. Instead of cutting or sawing the silage out, you lift it out a bale at a time. The bale comes out about the same size as it went in. A pry tool helps in loosening it.

Use only twine to tie bales (if you tie them) because wire rusts and may lead to hardware trouble in cows.

Farmers in England, partly because they lack forage choppers, have made long grass silage for decades. In France, the Low Countries, and Scandanavia, one sees long grass silage stored in circular pits of concrete or brick. These are built partly above, partly below ground. The above-ground part is low enough to permit easy pitching from a wagon. You see one of the silos on almost every farm in Norway, Sweden and Finland. The popular preservative is A.I.V., an acid. The letters "A.I.V." are the initials of A. I. Virtanen, the Finnish scientist who developed this method of preserving silage.

In England, where grasses and legumes are practically the only kind of crops that go into silos, farmers are also turning to the baler as a silage making tool. In 1954, for example, many farmers in the west of Scotland, as well as other parts of Britain, first put their balers to use in making silage, H. A. Waterson of the West of Scotland Agricultural College reports.

Waterson says a bale of half normal size will be heavy enough and to get this bale, the machine must be adjusted to trip twice as often as it normally would. Keep the shearing knife sharp to cut the grass off smoothly. A few farmers have tried baling the grass without tying the bales. The bales fall apart and are loaded by fork, a part of a bale at a whack. The problem of packing, however, is increased with broken bales.

Making long grass silage, in the opinion of Ohio Agricultural Experiment Station silage expert, Dr. Charles Rogers, is the supreme test of the silage maker's skill. The big tasks are getting the bulky crop spread in the silo evenly and packed sufficiently. When it is rolled off a truck or wagon it has a tendency to roll up and form a giant-size round bale. This is bad for two reasons. First, unless the wet forage is evenly packed in the trench silo there will be air pockets in it and this leads to uneven fermentation and spoilage. Second reason is that when it is unevenly spread, it is a herculean task to get the interlocking silage out of the silo. Unloading long grass silage reduces itself to a stinking, back-breaking job, and nobody can talk himself out of that.

W. D. Hunnicutt, of the National Dairy Products Corp., reports on the operation of Ralph Pomeroy, Westfield, Mass. Mr. Hunnicutt says:

"Ralph Pomeroy has a trench silo 10 ft. wide at the bottom, 16 ft. wide at the top, 10 ft. deep, and 75 ft. long. The long grass that he dumped and packed into the trench as silage weighs approximately 35 to 40 lbs. per cu. ft. The forage was packed very thoroughly by starting filling at the upper end, using a looped wire cable with the ends attached to the rear of the wagon and running under the load, up the front end and half way back on the top of the load. A chain is attached to the end of the loop for pulling the load off into the trench with a tractor. As the upper end is filled, the wagon is backed over the filled portion and successive dumps are made until the trench is filled and heaped so as to result in an arch when settled not more than one foot higher in the middle than the sides of the trench. In his case he did not fill high enough to allow for settling so that he had a level of only 9 ft. of settled silage in the trench. This did not hurt anything from a drainage standpoint, however, because he covered it with 6 inches of sawdust (12 inches would have been better). The 6-inch covering that was made, prevented spoilage on top, but some rain water seeped through which washed the acid out of the top foot of silage. The cows ate this portion readily, however. If he had used one foot of sawdust, no water would have penetrated through the sawdust so that he would have had uniform acid content in the silage.

"I would estimate that the Pomeroy trench silo held around 165 tons of long grass silage. He used as a preservative for this quantity, 3 tons of citrus meal which was scattered over each

load after it was dumped. This probably was of little or no value because it did not become incorporated with the long grass silage and could be seen in layers in some places in the face of the cut portion of the grass silage in the trench. Since he put forage in in a moist condition at the proper wilt stage, no spoilage occurred and the silage was of excellent quality.

"The bottom layer of long grass forage in the trench was straight alfalfa, cut in the early bloom stage. The next layer was red clover and Ladino, with the red clover in the full blossom stage, and the top layer was oats put in when it was just starting to head. I think the secret of Mr. Pomeroy's success with his long grass silage was the thorough packing which consisted of the weight of the wagon and tractor as it was backed over the dumped forage while the trench was being filled, and the subsequent packing twice a day for nearly a week that was given it with a tractor before the filled trench was filled with sawdust. The long grass silage in the trench was packed very tight—so tight that when it is sliced off with the chain saw, just like a loaf of bread, the cut face shows no spoilage and remains palatable for a week or more until the next slice is made.

"This matter of thorough packing and use of a chain saw for cutting the vertical slice, so as to leave a smooth cut face from top to bottom, is important because it permits having a wider trench of greater capacity. This provides opportunity for self-feeding out of the trench, because it is not necessary to freshen the cut face each day, as is usually recommended.

"A chain saw is used by Pomeroy to cut a slice of silage across the face of the trench from 2 ft. to 3 ft. thick. The thickness of the slice is influenced by the amount that is to be fed. His 28 inch chain saw cuts down about 2 ft. at a time. This 2 ft. slice is cut across with the chain saw to make blocks 3 ft. to 4 ft. long by 24 inches deep and whatever thickness the slice may be. The bottom of the rectangular block lifts out easily without cutting, due to the forage being pressed so tightly that it lifts off in layers 3 to 4 inches thick.

"The long grass silage next to the walls of the trench is cut with a hand hay knife so as to prevent dulling the saw on the dirt or concrete. The entire cutting operation takes about 2 minutes and provides enough silage for his herd of 36 Holsteins for 2 days. Successive cuts of 2 ft. deep each are made until that slice is fed out to the bottom of the trench.

"Pomeroy removes the blocks in layers with a hand fork and throws them into a bunker wagon that is backed into the trench. An easier way would be to use a fork on the front of the tractor and lift the block out, dumping either into the silage bunks in the feed lot or into a bunker wagon or wagons if it has to be hauled some distance for feeding. It is best to do everything possible from the tractor seat.

"Pomeroy has a herd of 36 big Holstein cows. They are eating 80 lbs. of long grass silage a day. He states that they are milking as well, or better, than they did last summer on lush pasturage. We tried to challenge this statement by asking if he has more fresh cows this winter than last summer, but he persisted in the statement that his milk flow was as good as on grass. This seems to indicate that long grass silage may go a long way towards maintaining a uniform milk flow the year around, provided this abundance of good forage is combined with a fall freshening schedule.

"Dr. Lorraine Gall, who is in charge of our Rumen Digestion Experimental Work at the National Dairy Research Laboratory at Oakdale, Long Island, was asked whether there would be any difference in the fineness of the material when it entered the paunch as between long grass silage and chopped grass silage. She answered yes, a lot, because the cow doesn't chew the forage as it goes down. She further stated that the microflora in the rumen that digests the forage can work on it better if it goes in long and loose. This man then asked if the cud chewing operation would not ultimately result in forage of the same fineness irrespective of whether it was long grass or chopped grass silage. Dr. Gall replied that cud chewing only applied to a small percentage of the rumen content, principally the stringy, fibrous

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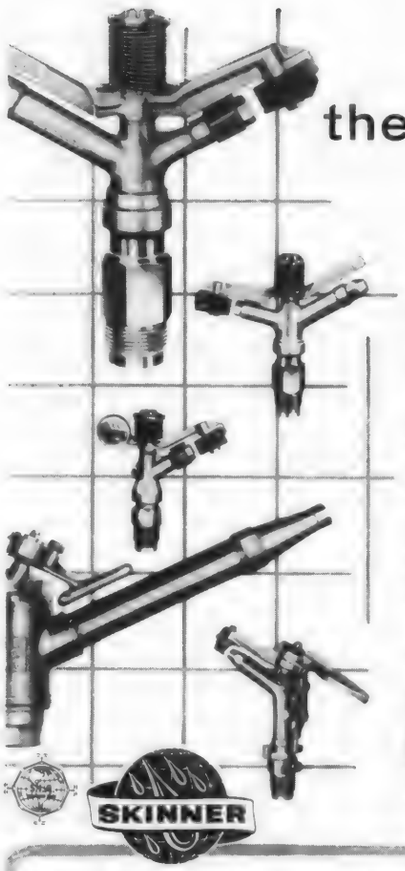

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material that rises to the top of the rumen contents, that the bacteria were less able to digest.

"These questions and answers probably explain the statements that have been made by a number of farmers in Massachusetts and elsewhere, who had fed long grass silage and chopped grass silage free choice to their cows at the same time —that their cows prefer the long grass silage and eat it up first. In this case, as in many others, the cow knows best, according to Dr. Gall."

The same crops that can be successfully stored as chopped silage are suitable for long grass silage. In southern Kentucky, they use Johnson grass and orchard grass. If you're planning to make silage from unchopped crops, however, it is best to pick grasses and legumes that can be stored fairly short and still be cut in the proper stage. One of the best of these combinations is red clover and timothy. A mixture of early red clover and late timothy is usually ready to cut when it is short and easy to handle. The crop should be cut by the time the clover reaches the early bud stage. This catches it young when it is high in protein and high in moisture. A Ladino, orchard grass mixture is also a good long grass silage combination. It should be harvested when the grass begins to head. Oats, too, make an excellent long grass silage, especially when planted as a nurse crop for grass.

Crops stored as long grass silage need little if any wilting. They should, according to Dr. Rogers, go into the silo with a moisture content of about 80 per cent. Squeeze it and if the juices run out, it's 80 per cent or better. Heavy juices help compact the mass.

The most common method of packing long grass in a trench silo is to run a tractor back and forth over it as each new level layer is put in place. When you are baling the grass, the baler helps compress it. But it should still be packed with the tractor a layer at a time. There is little need for preservatives where the crop is in the right stage of growth and has sufficient moisture content. Sodium metabisulfite is one of the best chemical silage preservatives now available. It helps hold the green color of siage and holds down strong odors. It should be thoroughly mixed through the silage crop and this is best accomplished when the preservative is in solution. The dry chemical should be stirred into water at the rate of 100 pounds of sodium metabisulfite to 30 gallons of water, then sprinkled on the silage crop at the rate of three gallons per ton.

Getting the preservative well mixed with long grass is more complicated than with chopped grass and should be taken into consideration. When pea vines are ensiled unchopped, the preservative is applied on the peas as they leave the huller on the elevator. This is not possible where grass is handled in bulk by a buck

rake or from a wagon. No one has come up with a solution except to pour the preservative slowly and carefully after the silage is in the trench.

Molasses, often added to chopped grass silage to improve palatability, can also be added to long grass silage. Because of the difficulty of applying molasses in the liquid form, powdered molasses is recommended. The rate for adding molasses varies, 60 to 80 lbs. per ton for grass, 80 to 100 lbs. for legumes. Louis Bromfield adds a little salt to his molasses treatment and reports increased palatability. This is done after the silage is in the trench.

Getting long grass into the silo is half the job. The other half comes in getting the silage out. Unbaled long grass is difficult to remove. Usually it must be cut loose and carted into feed bunks or picked up with a tractor scoop for hauling to the cows. Some farmers cut the silage loose with a tool made from a rolling coulter welded to an old auto axle. Chain saws have been used for sawing blocks of silage off the stack. The standard chain used for wood sawing cannot be used because of clogging and corrosion. A special silage chain, such as is made by the Oregon Saw Chain Corporation, Portland Oregon, can be fitted to the standard guide bar in about three minutes and does a good job of cutting chopped and long grass silage, even when frozen. The standard chain can be adapted for silage cutting by removing every other cutter and raker or by

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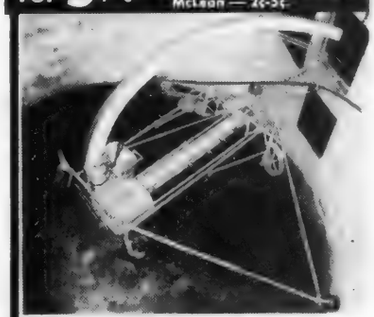

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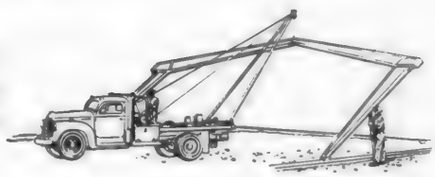

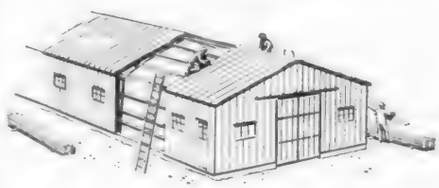

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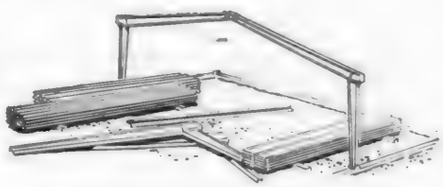

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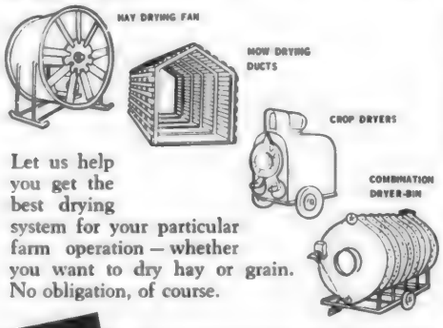

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filing the cutting edge of the blades until they slope backward. If this is done, the problem of corrosion remains unless the chain is made of chrome or similarly resistant steel.

Evan Baugh, who manages Purdue University's Throckmorton Farm, feeds steers all along one side of a box silo. He cuts off 10 to 12 inches of a three foot ledge with a rolling coulter axe and rolls the silage down in front of the feeding gate. The rolling coulter tool sounds good but anyone who has used it knows it is slow and about as back-breaking as pulling it out with a fork. Other tools, also requiring a strong back, are hay knives and axes.

In the extreme north, where silage might freeze to a considerable depth, the long grass poses the same problem as frozen chopped silage. There'll just be more chopping to do.

There have been some tries at self-feeding long grass silage. The cow has a job to do and if the grass is not too long, she can do it. But if the grass is very long, she won't have the pull to get enough to eat.

What the Agronomists Say

As for scientific studies on nutritional values, comparative costs, comparative labor and time, little has been done. A recent progress report by the USDA at Beltsville shows slightly greater feeding values in chopped silage. However, the single experiment was regarded as inconclusive partly because the covering used on both the unchopped silage and the control permitted leakage of air.

W. K. Kennedy, of the Cornell Agronomy Department, says, "Our experience with long grass silage is limited. In 1951 we studied the storing of both chopped and long grass silage in an above-ground horizontal silo. The silage was fed to heifers and notes on palatability were taken. We did not conduct a feeding trial but I can see no reason why long silage would be better or inferior to similar chopped forage.

"We feel very strongly that long silage has a place only on small farms where the farmer cannot justify a field chopper. Even then, hiring a custom chopper is generally more satisfactory than making long grass silage. Unless the forage is cut when very short and immature, this may reduce yields more than it increases quality; long forage is difficult to pack. It cannot be easily rolled off a wagon or truck and still obtain good packing. It must be spread out and this requires a tremendous amount of labor. If fields are near the silo, a buck rake can be used but most of our fields are likely to be farther than one-fourth mile and then a buck rake becomes increasingly inefficient.

"In summary, long grass silage can be made at lower equipment cost, but with increased labor. For most situations the extra labor costs for long grass silage are greater than the costs of chopping."

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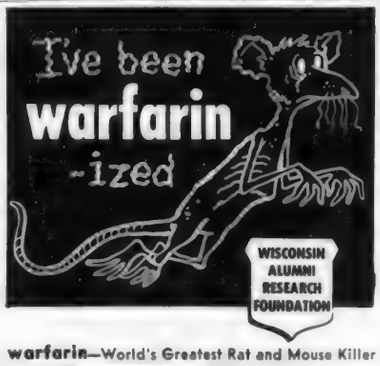

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This leaves us with a good many unanswered questions about nutrition and costs in putting up long grass silage. On the whole, those farmers who put up long grass silage are more definitely favorable than the research people, who are more impressed by what their scales and charts show than what they observe in the cow lot. There are those who tried long grass silage and gave it up; there are those who tried it and didn't change back to the chopped variety. A farmer can take his choice. If he tries long grass, he knows the way is almost uncharted—he'll have to depend on his own experience. Perhaps it shakes down to this—if you want grass silage, and haven't the machinery to chop it, long grass will make you good silage if you have the muscle to handle it. And, too, your cows might have the answer you want.

THE CASE FOR THE FARMER

(*Continued from page* 51)

only our nation has had to face the problem of over-abundance, and we've been trying to find the solution of a surplus with the same tools we used on scarcity. For this reason our betters can not be blamed for muffing the problem. They have no precedent to follow, no volumes of history to consult.

Farming is the only industry that goes right on producing a surplus after the market is glutted—farmers go right on farming themselves off their farms into the poorhouse. And everybody knows that

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regardless of the plan Congress enacts into law, barring plague, war, or revolution, there will be a surplus. The farmers will see to that. Under acreage controls and marketing quotas and plow-down cotton they found a way to beat the purpose of the law and they will find a way to beat the new law. To the farmer, getting the most off his farm is not a crime—it's just doing what comes naturally. The good earth being what it is, and the farmer being what he is, we had better be prepared to live with surpluses for some time to come.

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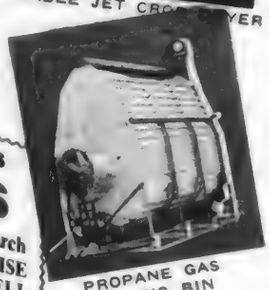

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Some humanists among the experts say there are really no surpluses, only abundance that if properly distributed would vanish. Make it cheap enough and somebody will buy it, they say. The realists say, "By golly, if three slices of bread is all the bread I want, you couldn't hire me (for very long, that is) to eat more than three slices, no matter how cheap."

The social workers say that if every school kid drank a pint of milk a day, the milk surplus would vanish—*give them each a pint of milk*. Those who know farmers say that no sooner would our milk surplus vanish down the throats of our school children than the dairy farmer, seeing the price firm up, would add another cow or two to his herd and—presto, another surplus. The American genius is to produce; and who can say that is a crime.

There's another angle to a milk give-away. The prospect of the government buying a pint of milk a day for every school child will not be lost on other specialized farm lobbies. We can expect the potato interests to show that by whipping a teaspoon of dehydrated potatoes into each pint of milk that the potato starch and vitamins will add weight to every undernourished child. Experienced log rollers on Capitol Hill from California and Florida would show, nutritionally, that by alternating milk one day with orange juice the next, that better health, and by that token, better education and a better nation would result.

The Big Give-Away

Regardless of how generous our intentions, our foreign policy has made it increasingly difficult to give surpluses away. Secretary Benson offered England a gift of lard. "We've got an infant peanut oil industry in Africa to protect," they said; "easy on the lard."

How would you like to be a Canadian dickering with, say the Spaniards, for the sale of Canadian wheat and when you had arrived at a price, Uncle Sam walked in and said, "Wait, Mr. Franco, why pay these Canadians $1.50 for wheat? I've got 300,000,000 bushels I'll give you for free." Mr. Dulles doesn't fancy having angry Canadians on his back—he's busy already with the Communists.

We keep trying. Mr. Benson announced a "giant" give-away to international welfare groups. This stuff will go to odd corners of the world where it would do the least harm politically. But these gifts will make only a small dent in our surpluses. For example, we'll give away 8,000,000 bushels of wheat; we have about 600,000,000 bushels surplus.

There is another angle to give-away which hardly adds to its luster—you can't blame John Q. Citizen for wondering if there isn't something screwy about giving away butter to foreigners when it costs him 60 cents a pound at the corner grocery. He pays more for margarine than the Germans are paying for our butter. And what's more, he helped pay for that give-away butter.

Giving away any kind of farm crop invariably brings the same reaction—the price firms and farmers jump headlong into production—the next year there's a bigger surplus. So, say the economists, if you're going to firm the price artificially, you must reduce the production, farm for farm, to prevent an immediate overproduction of the same crop next season.

The Grange, the Farmers' Union, the Farm Bureau, and celebrated statesmen have called on the Department of Agriculture to stimulate exports. Our export possibilities are shrinking like a prune in the August sun. France wants to export wheat; France historically bought American wheat. Australia has a 95,000,000 bushel wheat surplus. Thanks to our own U. S. gifts in money and technical help, many importing nations, such as India, which has wheat to *export,* are now on their feet and are sending their best salesmen to undersell us. They undersell us because they can produce at a much lower cost—English farm labor recently got a boost in wages—to $18.00 a week.

We can't give our surpluses away, we can't export them, we can't eat them ourselves—we have to prevent them. This is the job Congress is working on. If Congress is to give a bounty to

the farmer, it must get back some form of production control. Or the bounty will create an even greater surplus. The farmer won't get the bounty unless he submits to the control. The more bounty he gets, the more control; and the more the control, the less he is free.

Theodore Schultz, who is chairman of the Economics Department at the University of Chicago, says that when a fine mesh of steel wires runs out from the government to every farm in the land, and bureaucratic regulations run every farm and every farmer, then for a certainty is production killed. Excessive government control has killed production in Russia, the one fertile nation in the world where there is a scarcity of food.

Other economists have noted that as bureaucratic controls become wider, the government is more loath than ever to let up on them. Once the farmer has sold himself down the river, he's down the river to stay with rigid farm-for-farm controls.

The plan Congress brings out will be the same old pair of pants with a few new patches. Examine the old patches and you'll recognize the fine needlework of a good many celebrated men — Herbert Hoover, Henry Wallace, Mr. Peepers,

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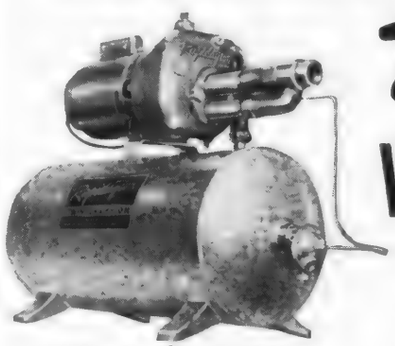

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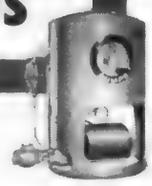

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Milo Perkins, Clinton Anderson, Charles Brannan, Ezra Benson, and others. What comes out of Congress will be just what the farmer says his pants are today, patch upon patch. The Soil Bank plan is Henry Wallace's "plow down cotton and corn," dusted off and pressed.

But somehow, neither the administration nor the politicians put it to the farmer straightaway. (1) In peace time, when the farmer grows all he can, prices go lower because there is no way to consume it, give it away, or export it at cut prices. (2) This being so, if the government is to give the farmer anything, the bounty must be tied directly into federal laws which reduce farm by farm the amount of crops to be grown. (3) The small farmer can never get enough benefit from producing fewer crops to make up for his reduced cash position. (4) As soon as the government offers and the farmer accepts a bounty, some measure of production control, backed by the policing power of the state, is inevitable. The more bounty, the more control, the less freedom. (5) As a nation, we have not had it squarely and soberly put to us by either the Secretary of Agriculture or the President that we must decide once and for all, before we create a farm program, whether our position is that of an economist ("Let the big fish eat the little fish") or the philosopher ("I am my brother's keeper"). Once we decide clearly in our own mind which of the two we are, the farm program will be easier to solve.

OVER THE BACK FENCE

(*Continued from page* 137)

no one ever cussed a stalled tractor into operation. That's something you *could* do with a mule.

Social Security Tips For Farmers To the self-employed farmer: If you do not already have a social security account number, get one. Use it with your income tax return for 1955 (on Schedule SE of your tax forms) in order to get credit for your earnings. In other words, report your self-employment social security tax with the same return you use to report your Federal income tax. If, in addition to farming, you have net income from other self-employment covered by the social security law (for example, if you own a store) combine your net earnings to report self-employment tax up to the amount of $4200.

Note that you use *actual net earnings* in computing self-employment farm income for the year or exercise one of the following options:

(1) if your gross income is more than $1800 and your actual net earnings

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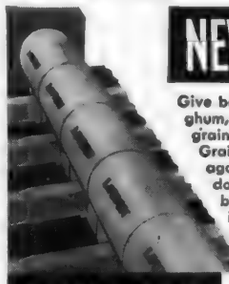

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are less than $900, you may report the $900 figure.

(2) If your gross is from $800 to $1800, you may report one-half of the gross instead of figuring actual net earnings. (Thus, with an $800 gross, you would report $400.)

Use these optional methods *only* for computing self-employment tax on farm income.

To the Share-Farmer: Your farm income *counts* as self-employment earnings for Social Security:

(1) if you arranged to produce a crop or livestock on the landowner's farm:

(2) if you have agreed to receive a percentage share of the crop or livestock or a share of the proceeds from the sale of either; and

(3) if the amount of your share depends on the amount of the crop, and you stand to gain or lose by reason of your own application to the actual farming or care given the stock.

Social security—more farm bookkeeping.

To the Landowner: Note that income from a crop produced on your land by a share-farmer is the same as rental from real estate and does *not* count towards *your* social security. The only wage credits involved are those which the share-farmer receives as a self-employed individual.

To Fathers and Sons Who Are Legal Partners: You are both self-employed.

To Husbands and Wives Who Are Not Legal Partners: Even though both of you help on the farm, you credit net earnings only for the one who has management and control of the farm. (This is usually Papa.)

To Farm Employers:

(1) Keep accurate records of the correct name and social security number of each employee to whom you expect to pay $100 or more cash wages during the year.

(2) Record the wages and the 2% tax as you deduct it on each employee's earnings up to $4200 per year.

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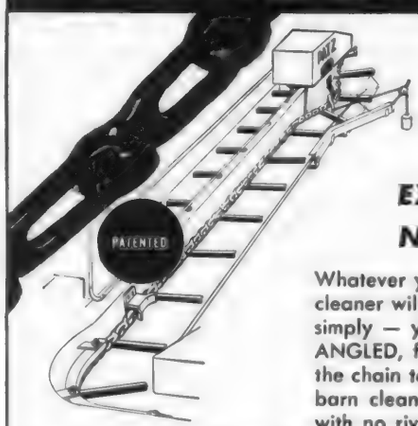

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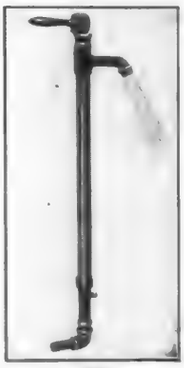

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(3) Add an equal amount of 2%, making a total of 4% tax which you pay to the District Director of Internal Revenue (and don't forget to obtain your employer's identification number from him).

(4) For taxable cash wages totalling $2500 or more before October 1st, file Form 943A (indicating total wages paid) and pay this 4% tax by October 31st.

(5) If you pay less than $2500 taxable wages before October 1st, report and pay the 4% tax on Form 943 in January, after the year in which the wages are paid.

To Get Information and Service for Social Security:

(1) See your nearest social security office to get an account number or information about benefits; but

(2) see your Internal Revenue District Office to inquire about tax liability and the preparation of reports.

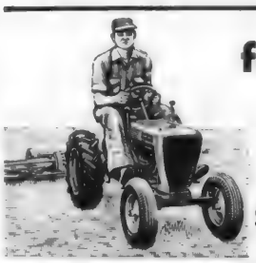
Remember: a *complete* Federal income tax report, including farm self-employment schedules, is the key to social security credit for the self-employed farmer.

Kicks Come High Sometimes it seems like it's worth it, but it costs $1.25 to kick a hog! Careless handling of livestock is costing farmers an average of $5.64 per head for bruise losses on cattle and $1.25 per head on hogs, the National Live Stock Producer reports. The magazine cites a study of 676,000 hogs and 221,000 cattle received over a 27-month period at 50 packing plants. On the average, one of every 13 hogs was bruised and one of every 14 cattle had a damaged carcass. Total losses to farmers amounted to $88,000 on cattle and $63,000 on hogs.

A breakdown of hog bruises shows that 62 per cent were man-made by canes, whips, clubs, kicking, and prodding. The other 38 per cent were the result of crowding, trampling, nail puncture, and others. On cattle, 66 per cent of the bruises were caused by crowding, bumping, and rushing; 14 per cent by trampling; 10 per cent by canes, whips, and clubs; 5 per cent by horns; and 7 per cent by other causes. Greatest loss on hogs—48 per cent—were bruises injuring the hams and on cattle 35 per cent of the bruises occurred in the hip and loin area.

The magazine recommends the use of canvas slappers instead of whips and canes to drive livestock, elimination of protruding nails, broken boards in truckbeds, dehorning, and careful driving en route to market.

Santa Gertrudis For Longhorns After 435 years America has paid an old debt to Spain. In 1521 several head of Spanish cattle were shipped to Vera Cruz, Mexico. This was the first shipment of cattle to the North American



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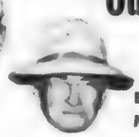
"RILCO construction can take it!"

OSWALD M. LYNGASS, Doran, Minnesota

"We get plenty of rough weather in Minnesota," says Oswald Lyngass. "So we have to be sure of building construction that can take wind and snow loads. That's why I chose Rilco."

"Or rather I should say that's *one* of the reasons," he continues. "Another is . . . I needed space. And got it. My Rilco barn has a capacity of 40 head, and its design provides space for calves and maternity pens in addition to the loafing area and milking parlor. I'm really sold on Rilco!"

Other reasons for Mr. Lyngass' enthusiasm include the low cost and remarkable speed and simplicity of erection. That's because Rilco rafters are precision cut, drilled for hardware and delivered ready for quick assembly. Each rafter is made of selected kiln-dried West Coast Douglas Fir, permanently bonded with waterproof glue.



"Our buildings are easy to clean . . . 100% usable!"

EARL AND GEORGE DAUBERMAN
Maple Park, Illinois

The Daubermans have both a Rilco Feeder Barn and a Rilco Machine Shed.

"We use our Feeder Barn for about 300 Whiteface Herefords," says Mr. Dauberman. "I can run my tractor right in and wheel it around into every corner."

Rilco glued-laminated rafters come in sizes for any building your farm needs. For complete construction data, mail coupon.

TYPICAL COST
All Materials Above Foundation
90¢ PER * SQ. FT.
Type 55 Barn, 30' x 132'

*Price based on first quality materials, and will vary according to locality.

For your protection and convenience, sold only through your local lumber dealer.

RILCO GLUED LAMINATED RAFTERS

RILCO LAMINATED PRODUCTS, Inc.
2508 First National Bank Building, St. Paul 1, Minnesota

● Please send new free Rilco Barn Catalog and information on the following farm buildings:

☐ Two-Story Barns ☐ One-Story Barns ☐ Machine Sheds ☐ Hog and Poultry Houses

Name_____

Address_____

Town_____ State_____

continent. From these cattle came the old Texas Longhorn.

Recently 18 head of Santa Gertrudis, America's first original beef breed, left Kingsville, Texas, by truck, en route to Spain and consigned to the Minister of Agricuture in that country. The cattle, nine purebred bulls from the King Ranch in South Texas, where the breed was developed, and nine heifers from the Armstrong Ranch, neighbor to the King Ranch on the south, were shipped by plane.

Silage in Bags Giant plastic packages, each with a capacity of hundreds of tons, may provide farmers with a low-cost solution to one of their major storage problems. Agricultural engineers at Rutgers have reported favorable results with silage put up in bags. These plastic silos are not expected to replace the standard tower-like structures in which livestock farmers store much of their winter feed supply, but they'll serve well for the surplus after the silo is filled.

Plastics are particularly adaptable for silage storage because they are gas tight. Chopped green forage with preservative added can be placed in a compact pile, and quickly covered with plastic that is then tightly sealed.

Rutgers researchers achieve a neat package by piling chopped green material in successively smaller layers, so that the finished product, before it is covered with plastic, looks like a huge wedding cake. Snow fence is used to form the layers. The plastic, which is held to the ground by the weight of the silage, is pulled up over the pile and tied securely. Immediately gases begin to collect and fill the envelope. After about 96 hours the plastic collapses about the pile.

Silage juices are allowed to escape by making holes at the base of the bag on at least two sides. These openings are later closed with tape or by gathering the section of the plastic in which holes were made and tying with string.

NOW! A COMPLETELY NEW
PAPEC FORAGE HARVESTER

FAMOUS PAPEC QUALITY and PERFORMANCE

PRICED LOWER THAN ANY OTHER MAKE!

No. 32
BASE UNIT WITH PTO
$1025.00
3 QUICK-HITCH ATTACHMENT
DIRECT CUT $325.00
HAY PICK-UP $185.00
ROW CROP $285.00
(all f.o.b. factory)

ROW CROP ATTACHMENT cuts and chops tall, short or average crops clean and fast.

HAY PICK-UP ATTACHMENT handles heavy or light windrows fast, leaves a clean field.

DIRECT CUT ATTACHMENT cuts enough green feed for a day's feeding in minutes.

NOW after two seasons of the toughest kind of field testing, the Papec No. 32 Forage Harvester joins its famous brothers as a rugged, top performer at the lowest price a complete 3-attachment harvester has ever been offered by anyone. It has the capacity and built-in quality for which Papec is noted. Consider these features:

- BIG CAPACITY – full 14" wide, 98 sq. in. throat
- SIMPLE, STURDY DESIGN, FEWER MOVING PARTS
- LIGHT, HIGHLY MANEUVERABLE, COMPACT
- QUICKEST CHANGING ATTACHMENTS
- ADJUSTABLE AXLES
- SIDE and REAR FEED DELIVERY
- AUTOMATIC DELIVERY PIPE CONTROL
- PATENTED SILAGE SHELF
- ADJUSTABLE HAY PICK-UP FINGERS
- SIMPLIFIED DIRECT CUT REEL
- STRAIGHT, EASY-TO-SHARPEN KNIVES
- HEAVY, HIGH SPEED KNIFE WHEEL

The Papec No. 32 Forage Harvester has turned in an outstanding performance on all types of forage crops under widely varying conditions. Because of its attractive price, it offers farmers with smaller herds the opportunity to enjoy the benefits of a *Forage Harvester.*

With the "32", harvesting crops is faster and easier. Maximum amount of digestible nutrients is obtained. More milk, more meat — *more money* from the same acreage.

You Can't Buy Equal Capacity or Comparable Performance for Anywhere Near the Price of the New PAPEC 32

See your Papec dealer or send name on margin of ad for FREE booklet describing the New No. 32 Papec Forage Harvester.

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Shortsville, New York

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HAMMER MILLS · ENSILAGE CUTTERS · FEED MIXERS

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Records accurately *Hours* and *Minutes* of engine operation. Not a revolution counter, but an electric timing instrument approved by leading manufacturers. Easy to install . . . low price. See your dealer or *Write:*

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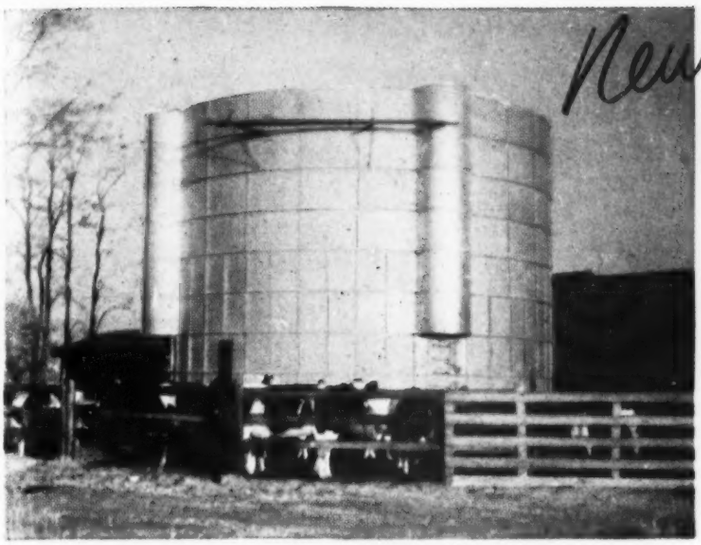
World's Largest Builders of Running Time Meters



Lawrence Begg's JUMBO SILO, Allen Co., Ohio

New MARTIN BUILDINGS FOR THE ECONOMY-MINDED FARMER

BEGG SEED FARMS
PRODUCERS OF
OHIO CERTIFIED SEEDS
R. R. No. 1
COLUMBUS GROVE, OHIO

October 26, 1955

Martin Steel Products Corp.
Mansfield, Ohio

Gentlemen:

In regard to the Jumbo diameter silo, I am very well pleased with it. So many people had questioned whether we could feed enough off the top to keep it from spoiling on top [illegible] I had the same question myself. However, we have had no trouble on it when [illegible] and the silage remains good right to the bottom. We have fed it too, down on it when [illegible] and have not had to throw away any feed. The cows like it too. Cows are continually [illegible] and they seem to do well on it. [illegible] without much trouble. Some people think [illegible] but I think it is [illegible] and [illegible] about six feet per day. Silage [illegible] for [illegible] is [illegible].

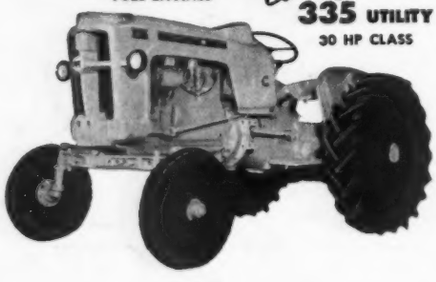
From the standpoint [illegible] I think the cheapest storage per ton [illegible] is the upright type though.

To have good cement stave, good steel, [illegible] and above ground [illegible] and some of the advantages over any of the above [illegible] and [illegible] and [illegible] and

meet MM's OUT-AHEAD tractors the all-new POWERLINED series

445 UTILITY
40 HP CLASS
GASOLINE, DIESEL,
LP GAS AND TRACTOR
FUEL ENGINES

coming SOON!
335 UTILITY
30 HP CLASS



Go ahead! Look 'em over! You've got a *right* to be proud, because these are the tractors *you* helped build!

Here's the question MM asked thousands of farmers, county agents, agricultural experts, and farm machinery dealers . . . "What should a new tractor give you to make farming pay better today?" Then MM took the answers and turned them into one of the biggest advances in power farming history: the completely new Minneapolis-Moline out-ahead tractors . . . the POWERlined series.

Here are just a few of the many, many new MM advantages that make the MM POWERlined series all new from the ground up. For your *own* profit future, be sure you get *all* the facts, Now!

WRITE NOW FOR FACTS ON THE OUT-AHEAD MM 445!
. . . AT YOUR MM DEALERS SOON!

DYNAMIC NEW DESIGN! The out-ahead POWERlined look.

BLAZING POWER! All new valve-in-head engines.

EXCLUSIVE AMPLI-TORC* Revolutionary MM Speed-Power Selector.

NEW POWER STEERING* Steer with a touch on any ground.

*Extra Equipment

NEW 3-POINT HITCH Quick hydraulic hook-ups with 2-way control.

NEW IMPLEMENTS Matched to POWERlined farming.

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